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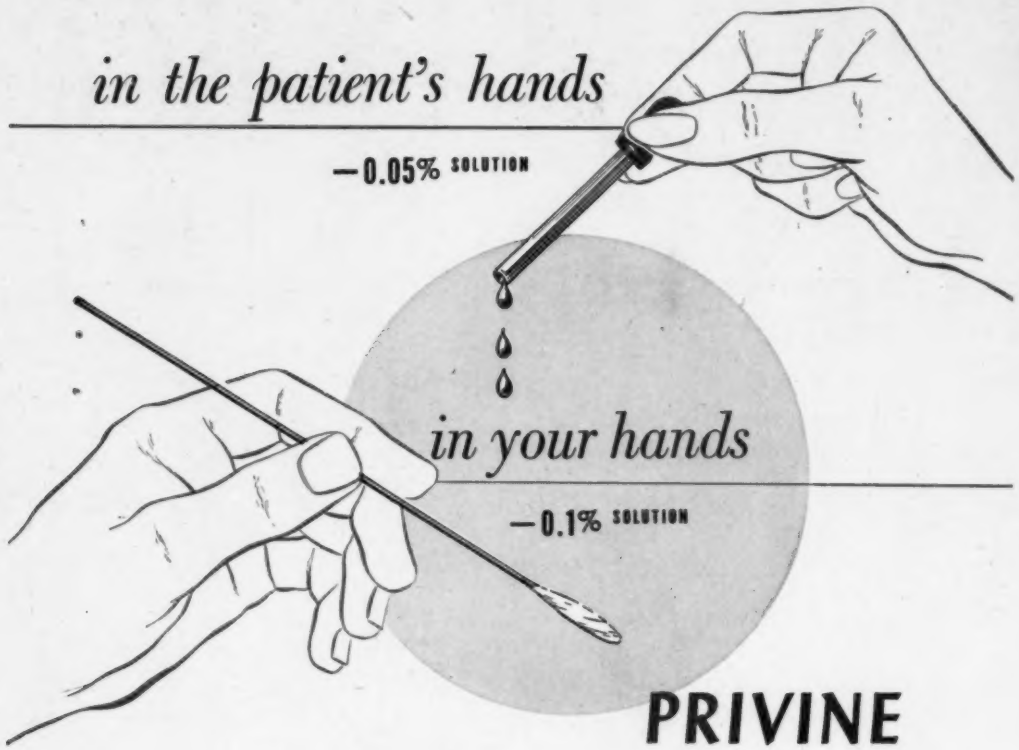

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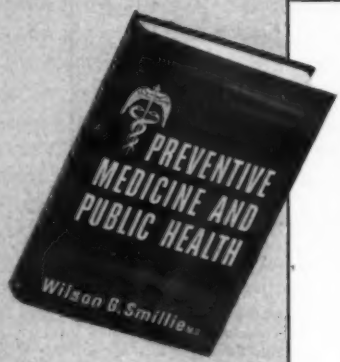

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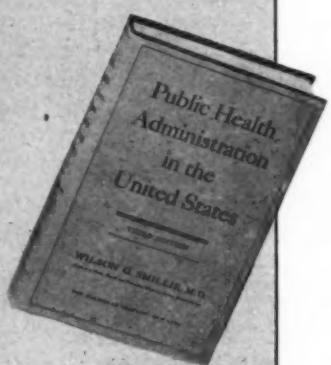

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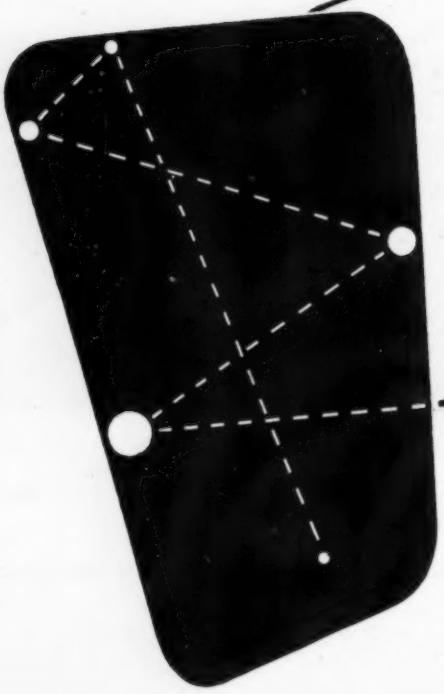

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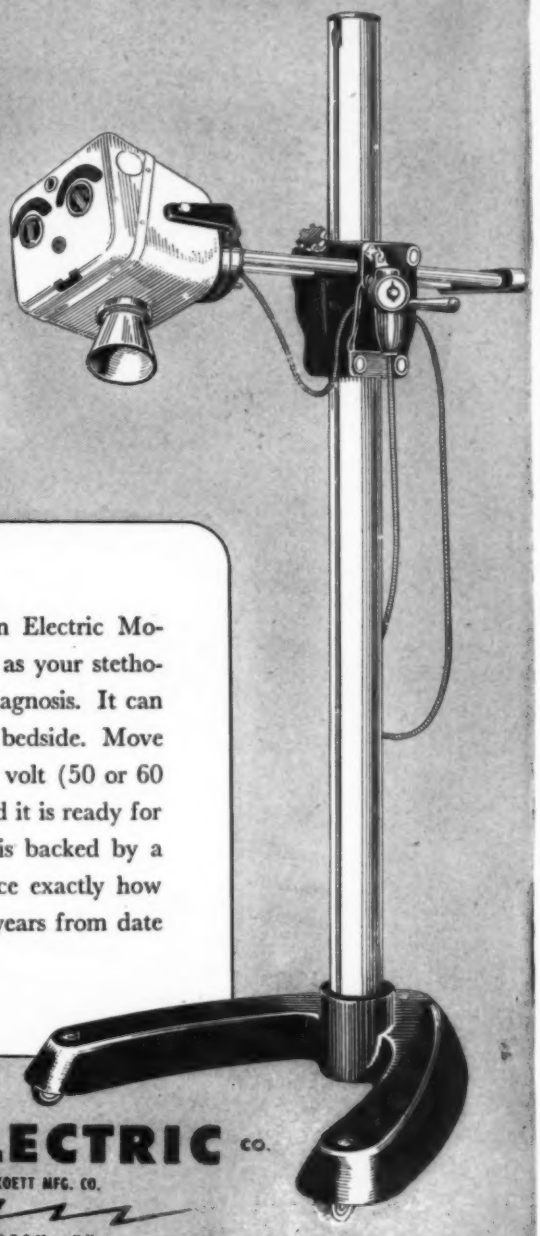

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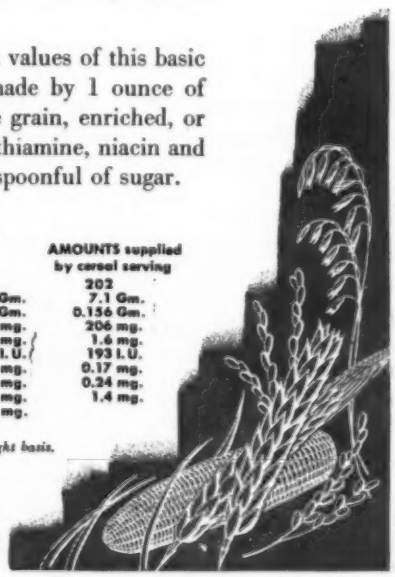
A widely endorsed basic breakfast pattern provides the foundation upon which a better nutritional start for the day can be built. Supplying fruit, cereal, milk, bread and butter, it contributes 611 calories and virtually all essential nutrients in generous amounts. The cereal serving, consisting of hot or ready-to-eat breakfast cereal, milk, and sugar, is the main dish of this meal. It supplies significant amounts of the nutrients provided by the breakfast, and adds both taste appeal and variety.

The table indicates the nutrient values of this basic breakfast and the contribution made by 1 ounce of ready-to-eat or hot cereal* (whole grain, enriched, or restored to whole grain values of thiamine, niacin and iron), 4 ounces of milk and 1 teaspoonful of sugar.

The presence of this seal indicates that all nutritional statements in this advertisement have been found acceptable by the Council on Foods and Nutrition of the American Medical Association.

BASIC BREAKFAST	TOTALS supplied by Basic Breakfast		AMOUNTS supplied by cereal serving
Orange juice, 4 oz.;	CALORIES	611	202
Ready-to-eat or Hot Cereal, 1 oz.;	PROTEIN	20.7 Gm.	7.1 Gm.
Whole Milk, 4 oz.;	CALCIUM	0.465 Gm.	0.156 Gm.
Sugar, 1 teaspoon;	PHOSPHORUS	488 mg.	206 mg.
Toast (enriched, white), 2 slices;	IRON	3 mg.	1.6 mg.
Butter, 5 Gm. (about 1 teaspoon);	VITAMIN A	1074 I. U.	193 I. U.
Whole Milk, 8 oz.	THIAMINE	0.52 mg.	0.17 mg.
	RIBOFLAVIN	0.87 mg.	0.24 mg.
	NIACIN	2.3 mg.	1.4 mg.
	ASCORBIC ACID	64.8 mg.	

*Composite average of all breakfast cereals on dry weight basis.



CEREAL INSTITUTE, INC.

A research and educational endeavor devoted to the betterment of national nutrition.

135 South La Salle Street • Chicago 3

Borden's prescription specialties are flexibly adaptable to cope effectively with the sharply increased number of your infant feeding problems.

BIOLAC—a complete infant formula (only vitamin C supplementation needed) for infants deprived of mother's milk.

DRYCO—a powdered, high-protein, low-fat, moderate carbohydrate milk food ideally suited for all formulas.

BETA-LACTOSE—an exceptionally palatable, highly soluble milk sugar for formula modification.

MULL-SOY—a hypo-allergenic emulsified soy food for infants and adults allergic to milk proteins. The 1:1 standard dilution approximates cow's milk in fat, protein, carbohydrate and mineral content.

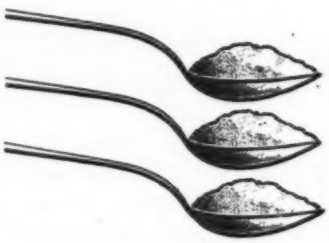
KLIM—a spray-dried whole milk with soft curd properties essential in infant feeding and special diets. Particularly valuable when availability or safety of fresh milk is uncertain.

Borden prescription products are available at all drug stores. Complete professional information may be obtained on request.

BORDEN'S PRESCRIPTION PRODUCTS DIVISION • 350 MADISON AVENUE, NEW YORK 17, N. Y.

*Aperient

*Laxative



*Cathartic

*Average dose

a balanced saline combination which acts by simple osmosis to dilute fecal residue and produce soft fluid bulk....
LAXATIVE
Sal Hepatica
CATHARTIC
EFFERVESCENT—SALINE
BRISTOL-MYERS CO., NEW YORK, N.Y.
evokes peristalsis and evacuation by nature's own methods.

Product of BRISTOL-MYERS
19 West 50 Street
New York 20, N. Y.

Experience is the Best Teacher

It's true in medicine—

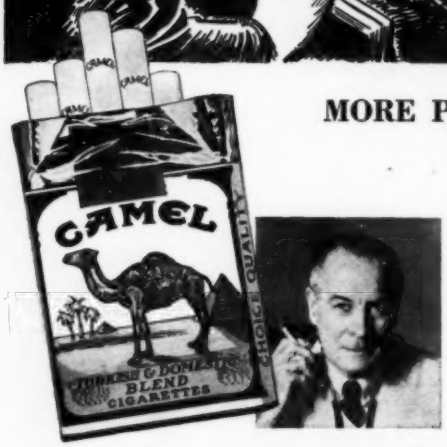
John William Ballantyne

(1861-1923)

proved it in obstetrics

BALLANTYNE, in his early studies of anatomical and pathological conditions found in the new-born, sensed the value of routine prenatal care in obstetrics. As a pioneer for prenatal care he was the first to establish a clinic for the expectant mother. World-wide acceptance of Ballantyne's concepts quickly followed his successful experiences in prenatal supervision.

Experience is the best teacher in choosing a cigarette, too!



MORE PEOPLE ARE SMOKING CAMELS THAN EVER BEFORE!

Yes, experience *is* the best teacher in choosing a cigarette. Millions of smokers who have tried and compared different brands have found that Camels suit them best. As a result, more and more people are smoking Camels as the "choice of experience."

Try Camels. See if your own taste doesn't appreciate the rich, full flavor of Camels. See if your own throat doesn't welcome Camel's cool mildness.

Let your own experience tell you why more people are smoking Camels than ever before.

According to a Nationwide survey:

More Doctors Smoke CAMELS

than any other cigarette

When 113,597 doctors from coast to coast — in every field of medicine — were asked by three independent research organizations to name the cigarette they smoked, more doctors named Camel than any other brand!

Baybank Presents—

for local application to burns and wounds

TRADE Vaseline MARK
Petrolatum Gauze Dressing
(Type I Absorbent Gauze U.S.P. 3" x 36")
Impregnated with "Vaseline" White Petroleum Jelly U.S.P.
Sterile
BAYBANK PHARMACEUTICALS, INC.
NEW YORK 4, N. Y. • MADE IN U. S. A.
Division of Chesebrough Mfg. Co. Cons'd
SEE INSTRUCTIONS ON REVERSE SIDE

❶ *Individual aluminum-foil envelope is cut open along the lengthwise lamination with sterile scissors.*

❷ *With sterile forceps, one end of "Vaseline" Sterile Petrolatum Gauze Dressing is pulled out, while envelope is held with other hand.*

❸ *The emerging end of dressing is applied to wound (at the same time that pleated portion is withdrawn), with a motion similar to that used with a roller bandage. Dressing may be cut into strips of preferred dimension, or folded into pads of thickness desired, or used full length.*

First developed exclusively for our Armed Forces during World War II, "Vaseline"* Sterile Petrolatum Gauze Dressings are now made available to the civilian medical profession, for first aid *and* definitive local therapy of burns . . . as a bland dressing and protective covering for numerous purposes . . . and as a wound pack. Today in both military and civilian circles the superiority of petrolatum applications is generally conceded—because they are bland and non-adherent, and appear to permit more rapid healing than tissue-devitalizing escharotics . . . also they are non-irritant and non-stimulating. Baybank Dressings are strips of sterile, fine-meshed, (44/36) absorbent cotton gauze, uniformly saturated in a sterile atmosphere with sterilized white petroleum jelly, accordion-folded, and heat-sealed in moisture-proof aluminum foil envelopes—they are thus dependably sterile . . . protected against extremes of temperature and humidity . . . and ready for immediate use anywhere, any time. When drawn to full length, they are 3 x 36 inches—supplied 6 envelopes to the box. Handy for physicians' bags, first-aid kits, etc.

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bland, non-adherent, non-irritant, in Individual STERILE Packages for dressing, covering or packing.

BAYBANK

Baybank Pharmaceuticals, Inc.—a subsidiary of the world-famous Chesebrough Mfg. Co. Cons'd—has been established to bring to the medical profession a series of distinctively new ethical medicaments, progressively formulated, authoritatively tested, and of lasting merit.

***Baybank Pharmaceuticals, Inc.,** 17 State Street, New York 4, N. Y.*
Division of Chesebrough Mfg. Co. Cons'd

*Trade-Mark Reg. U.S. Pat. Off.

8 YEARS OF

IN CHRONIC ARTHRITIS

*After treatment of "some 500 patients with chronic arthritis over a period of eight years," these conclusions about Ertron-Steroid Complex, Whittier, were reached in a leading clinic for the study and treatment of arthritis.**

"The medication is a relatively nontoxic therapeutic agent, and is beneficial in the treatment of chronic arthritis of the rheumatoid type.

Intolerance occasionally occurs but is easily controlled by reducing the dosage or discontinuing the medication temporarily.

Demonstrable signs of improvement are definitely noted, and are frequently sustained even after cessation of medication.

There is no increase of calcification of the blood vessels observed either roentgenologically or by ophthalmological examination of the retinal vessels.

The renal function is not impaired, as was demonstrated by urinalysis and nonprotein nitrogen determinations."

*The Uses of Vitamins in the Treatment of Chronic Arthritis; Traeger, C.H.; The Medical Clinics of N. Am. 30:616 (May) 1946.

ERTRON is a Registered Trade Mark of Nutrition Research Laboratories

RESEARCH

Each capsule of Ertron contains 5 milligrams of activation-products having antirachitic activity of 50,000 U.S.P. units. Biologically standardized.

ERTRON

Each ampule of Ertron Parenteral contains 1 cc of activation-products having antirachitic activity of 500,000 U.S.P. units in sesame oil. Biologically standardized. Combined oral and parenteral therapy is an effective measure of patient control by the physician.

NUTRITION
RESEARCH
LABORATORIES

CHICAGO

THE THRESHOLD . . . FOR TWO

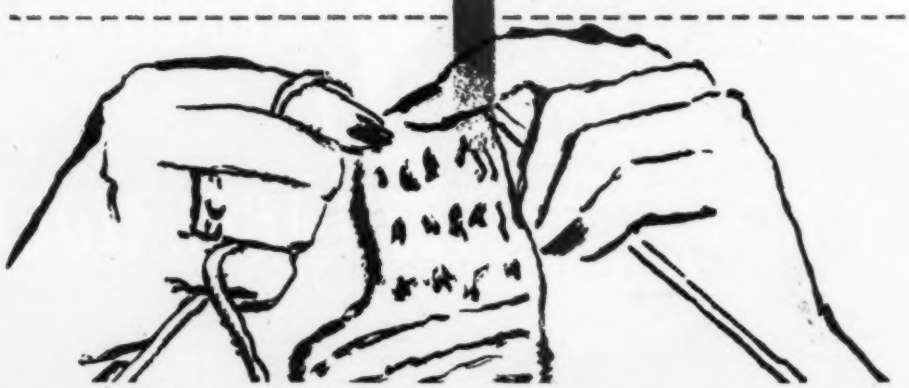
OBron—the first preparation to supply such large amounts of calcium, phosphorus, iron and essential vitamins in a single hermetically-sealed capsule—presents a convenient and effective means of meeting the increased nutritional demands of the mother and rapidly-growing fetus.

PREGNANCY

Adequate nutrition is especially important during embryonic life when the precursors of all organs are developed Since the fetus depends entirely on the maternal blood for its nutrition, sufficient nutrients must be supplied to meet the increased needs of the mother and fetus.

LACTATION

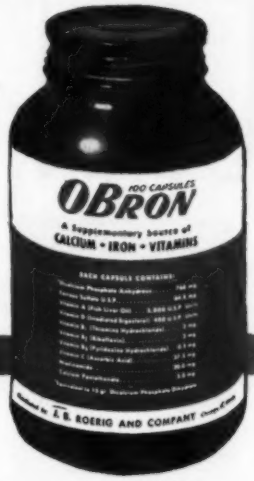
OBron, prescribed during the period of lactation, provides adequate minerals and vitamins to protect the nutritional state of the mother and insure an optimal content of these nutritional elements in the milk for the nursing child.



SPECIFICALLY DESIGNED FOR THE OB PATIENT

NOW FOR THE FIRST TIME

ALL IN ONE CAPSULE



CALCIUM	*Dicalcium Phosphate, Anhydrous..... 768 mg.
	Ferrous Sulfate, U.S.P..... 64.8 mg.
	Vitamin A (Fish-Liver Oil)..... 5,000 U.S.P. Units
PHOSPHORUS	Vitamin D (Irradiated Ergosterol)..... 400 U.S.P. Units
	Vitamin B_1 (Thiamine Hydrochloride)..... 2 mg.
	Vitamin B_2 (Riboflavin)..... 2 mg.
IRON	Vitamin B_6 (Pyridoxine Hydrochloride)..... 0.5 mg.
	Vitamin C..... 37.5 mg.
	Niacinamide..... 20.0 mg.
VITAMINS	Calcium Pantothenate..... 3.0 mg.

*(Equivalent to 15 Grains Dicalcium Phosphate Dihydrate)

a **ROERIG** *preparation*

OBRON FOR THE OB PATIENT

J. B. ROERIG AND COMPANY

536 Lake Shore Drive • Chicago 11, Illinois

A NEW Technique

When pregnancy is contraindicated maximal protection is assured by the new Lanteen technique. The mechanical protection afforded by the Lanteen Flat Spring Diaphragm is combined with the spermatocidal activity of the Lanteen Vaginal Jelly.

Complete description of the NEW TECHNIQUE *and physician's package will be sent upon request*

LANTEEN FLAT SPRING DIAPHRAGM

Easily Fitted—Collapsible in one plane only, Lanteen Flat Spring Diaphragm is easily placed without the aid of an inserter.

Long Lasting—Made of finest rubber, Lanteen Diaphragms are guaranteed against defects for a period of one year.

LANTEEN VAGINAL JELLY

More Effective—Lanteen Vaginal Jelly gives greater protection by combining active spermatocidal agents in a jelly readily miscible with the vaginal secretions.

Non-irritating, Non-toxic—Lanteen Vaginal Jelly is bland, safe, soothing and is rapidly destructive to spermatozoa.

***Ethically Promoted*—Advertised only to the medical profession**

Lanteen

LANTEEN MEDICAL LABORATORIES, INC.

900 North Franklin Street · Chicago 10, Illinois

AN IMPORTANT CONTRIBUTION TO *Peptic Ulcer Therapy*

Mucotin

TRADE MARK

MUCOTIN OFFERS A NEW APPROACH to medical management of peptic ulcer. Its base of highly purified gastric mucin provides a thick, tenacious coating of ulcer and gastric mucosa, resistant to diffusion of pepsin and HCl. It inhibits pepsin activity, while its antacid components, in balanced dosage, neutralize excess acidity. Mucotin is virtually histamine-free, will not produce acid rebound. Mucotin tablets are pleasantly flavored, highly palatable and have a minimal effect on gastro-intestinal function.

Mucotin

EACH MUCOTIN TABLET CONTAINS:

Gastric Mucin	2½ gr. (0.16 gm.)
Dried Aluminum Hydroxide Gel	4 gr. (0.25 gm.)
Magnesium Trisilicate	7 gr. (0.45 gm.)

Dose, 2 tablets every 2 hours, or as directed by physician. For optimal effect, tablets should be well chewed and patient advised not to drink liquids within a half hour after ingestion of tablets.

Supplied in dose dispenser packages of 50 tablets.

Harrower LABORATORY INC · GLENDALE, CALIFORNIA

CHLOROPHYLL THERAPY—

. . . accelerates healing
. . . stimulates normal cell growth
. . . controls superficial infection
. . . reduces scar formation
. . . is nontoxic—bland and soothing
. . . deodorizes malodorous lesions

Chronic osteomyelitis following compound fractures of leg twelve years before. Fourteen surgical procedures had failed to close the cavity. Pain and foul-smelling discharge from sinus caused patient to request amputation. (*Above*) appearance of lesion following saucerization.

Treatment with Chloresium Solution (Plain) daily for first two weeks, then Chloresium Ointment every other day. Cavity showed progressive closure, purulent drainage ceased. Pinch grafts of granulation tissue at base were successful and cavity closed completely. No subsequent breakdown.

Reports from clinicians emphasize the effectiveness of Chlorophyll Therapy as made possible by Chloresium

BOEHME, E. J.	The Treatment of Chronic Leg Ulcers with Special Reference to Ointment Containing Water-Soluble Chlorophyll.	The Lahey Clinic Bulletin, 4: 242 (1946)
BOWERS, WARNER F.	Chlorophyll in Wound Healing and Suppurative Disease.	Amer. J. Surgery, LXXIII: 37 (1947)
GAHAN, E., KLINE, P.R. and FINKLE, T.H.	Chlorophyll in the Treatment of Ulcers.	Arch. Dermat. & Syph. 47: 849 (1943)
HOLMES, G. W. and MUELLER, H. P.	Treatment of Post-Irradiation Erythema with Chlorophyll Ointment.	Am. J. Roentgenol. 50: 210 (1943)
LANGLEY, W. D. and MORGAN, W. S.	Chlorophyll in the Treatment of Dermatoses.	Penn. Med. Journal Vol. 51; No. 1 (1947)
MORGAN, W. S.	Chlorophyll Therapy A Review of 114 cases.	Guthrie Clinic Bulletin, 16: 94 (1947)
SMITH, L. W. and LIVINGSTON, A. E.	Chlorophyll: An Experimental Study of Its Water-Soluble Derivatives in Wound Healing.	Am. J. Surg. New Ser. LXII: 358 (1943)

Chloresium

Natural, nontoxic therapeutic chlorophyll preparations.
Available at leading drug stores

FREE! Complete literature and clinical samples of Chloresium Solution (Plain), Ointment and Nasal Solution will be sent upon request. Address Dept. JO-3.

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SOLE LICENSEE — LAKELAND FOUNDATION

Helpful in Certain Types of REDUCING DIETS

Two Sizes—1 oz. (4 envelopes) and ½ lb. 32 envelopes)

Especially when supplementary protein is indicated, experience has shown the value of Knox Gelatine in reducing diets.

Of course, Knox Gelatine should not be confused with artificially-flavored gelatine dessert powders which are ⅞ sugar and only ⅛ gelatine. Knox is all real gelatine—all protein, no sugar. So it is well to specify Knox by name.

With it a wide variety of attractive dishes can be made—dishes high in residue, low in calories, attractive to the appetite.

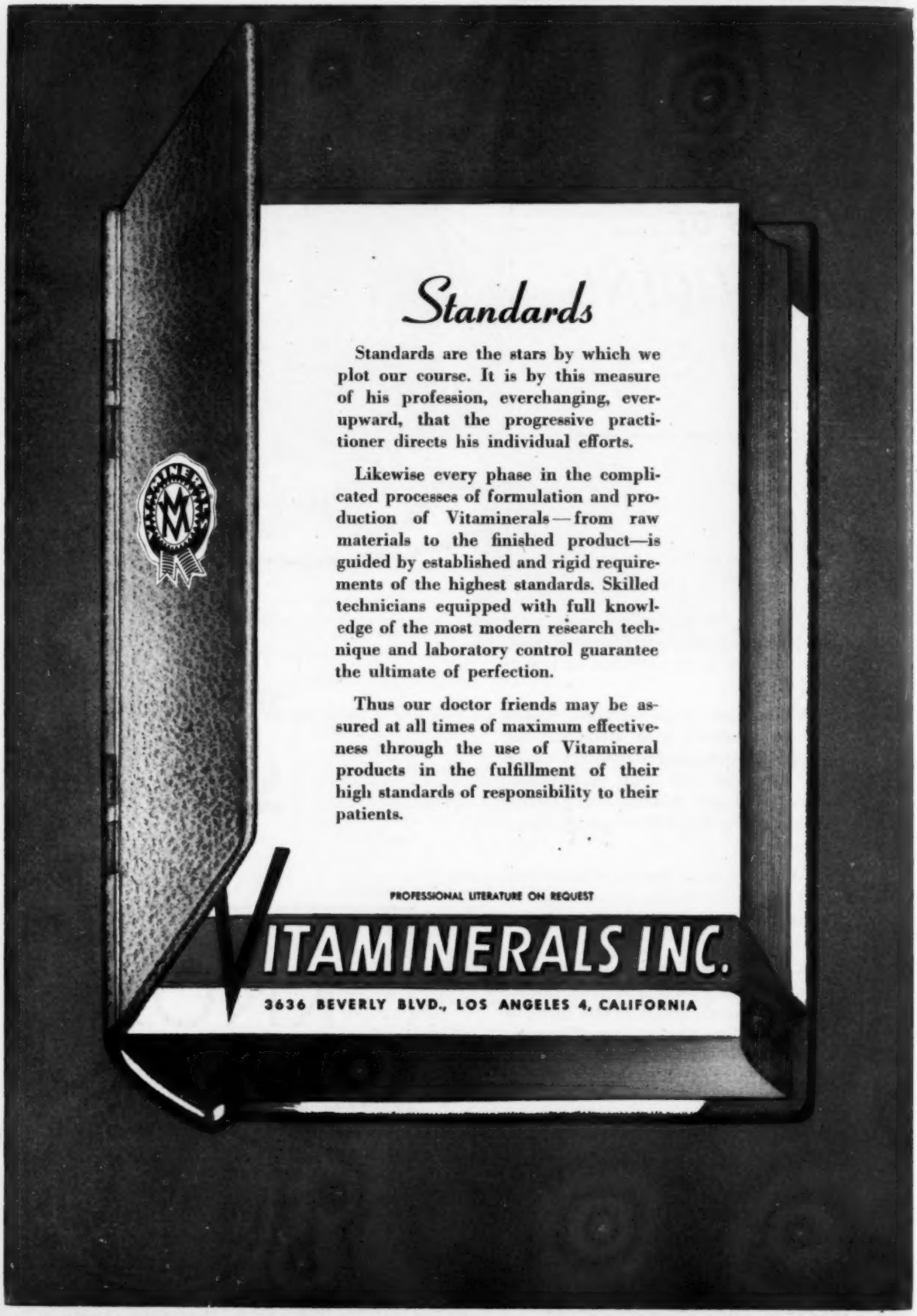
Knox is also recommended as a drink in water or diluted fruit juices. Taken between meals in this form, it eases the dieting by staving off hunger.

FREE BOOKLET
"Reducing Diets and Recipes,"

a helpful booklet for the reducing patient, will be sent to you free on request. Address Knox Gelatine, Dept. N-2, Johnstown, N. Y.

KNOX
Gelatine
U. S. P.

All Protein—No Sugar


Standards
Standards are the stars by which we plot our course. It is by this measure of his profession, everchanging, ever-upward, that the progressive practitioner directs his individual efforts.
Likewise every phase in the complicated processes of formulation and production of Vitaminerals — from raw materials to the finished product—is guided by established and rigid requirements of the highest standards. Skilled technicians equipped with full knowledge of the most modern research technique and laboratory control guarantee the ultimate of perfection.
Thus our doctor friends may be assured at all times of maximum effectiveness through the use of Vitamineral products in the fulfillment of their high standards of responsibility to their patients.
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NEO-CULTOL* gently corrects constipation by inducing restoration of a normal intestinal flora. It implants a viable culture of Lactobacillus acidophilus . . . counteracts putrefactive processes . . . avoids formation of the "cathartic habit" with its harmful sequelae, such as griping, flatulence, diarrheic movements . . . and constipational "rebound".

- GENTLY LUBRICATING
- PALATABLE
- NON-HABIT-FORMING
- MELTING POINT ADJUSTED TO PREVENT LEAKAGE

NEO-CULTOL

REG. U. S. PAT. OFF.

Lactobacillus acidophilus
in a Refined Mineral Oil Jelly
Chocolate Flavored

THE ARLINGTON CHEMICAL COMPANY
YONKERS 1 Arlington NEW YORK

SUPPLIED: In jars containing 6 oz.

*The word NEO-CULTOL is a registered trademark of The Arlington Chemical Company.

Research Study Shows Value of Cereal Lactic

Excerpts from laboratory studies show these research conclusions . . . "A dose of lactic acid causes a more energetic functioning of the stomach." . . . "The addition of 1 per cent of lactic acid markedly increases the effect of the intestinal juices." . . . "The weapon of the leucocytes in combating microbes is lactic acid." . . . "Ulcerative colitis in particular is a symptom of deficiency of vitamin B_2."

Further laboratory studies show that the total acidity as lactic acid, as determined by titration, is 6.57 per cent in Cereal Lactic. Cereal Lactic also contains the following vitamin content per ounce . . . A . . 11,250 USP units . . . B_1 . . . 647 USP units . . . D . . . 1,875 USP units and B_2 (G) . . . 275 Sher.-Borq. units. These are just some of the reasons Cereal Lactic is effective in combating Gastro-Intestinal ailments.

Physicians' samples and full detail sent upon request.

CEREAL LACTIC

Two Forms: "IMPROVED VITAMIN" and "ANTACID AND ABSORBENT"

Widely prescribed by the profession as an effective treatment for Gastro-Intestinal disorders.

CEREAL LACTIC COMPANY
Woodward, Iowa

EFFECTIVE RELIEF OF CERTAIN DISORDERS OF MUSCLE FUNCTION

PHYATROMINE

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PHYSOSTIGMINE SALICYLATE–ATROPINE SULFATE INJECTION

Kremers · Urban

PHYATROMINE* acts specifically to facilitate normal transmission of nerve impulses to skeletal muscles. It has proved markedly beneficial in: • Relief of muscle spasm • Relief of pain due to muscle spasm • Prevention, or reduction in severity, of deformities arising from muscle spasm.

For patients suffering from myasthenia gravis, arthritis and related conditions (fibrositis, bursitis, spondylitis, muscular stiffness, "charley horse"), and neuromuscular dysfunction due to trauma—PHYATROMINE offers a valuable aid to rapid, lasting relief. Many physicians use it to special advantage in conjunction with thermal or other physiotherapy.

ADVANTAGES: Economy of medication; simplified drug form; stable solution—ready for immediate use; relative freedom from unwanted side-effects. Often, relief is experienced in fifteen to thirty minutes after injection.

FORMULA: Each cc. of PHYATROMINE contains 0.6 mg. each of physostigmine salicylate and atropine sulfate.

SUPPLIED: 30-cc. multiple-dose vials; 1-cc. ampuls, boxes of 25.

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Please send me:
☐ Professional sample vial of 5 cc., without cost or obligation.
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Send bill ☐ C.O.D. ☐
Prices: 30-cc. vial: $6.00; box of 25 1-cc. ampuls: $6.00.

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PYROGAWZ

Efficacious
Medicated Gauze

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PHARMACEUTICAL CHEMISTS SINCE 1886
ROCHESTER, NEW YORK

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Physician's Bag
NO. 37B
Genuine Cowhide (Seal Grain)

The exterior of this bag is made of GENUINE COWHIDE leather (SEAL GRAIN) with chrome plated expansion lock, leather covered steel frame, welted seams and double handles. The interior of the bag has a fine selected lining, an adjustable strap for bottles, a utility side pocket and a compartment to hold the blood pressure apparatus.

THE GENUINE COWHIDE BAG (SEAL GRAIN) is made in the following sizes:

16" Long	7" Wide	10½" High
17" "	7¼" "	11" "
18" "	7¼" "	11" "

See Your Nearest Dealer for Other Types of Medical Bags Manufactured by

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AT HOME OR AWAY SPOT TESTS SIMPLIFY URINALYSIS

NO TEST TUBES • NO MEASURING • NO BOILING

Diabetics welcome "Spot Tests", (ready to use dry reagents), because of the ease and simplicity in using. No test tubes, no boiling, no measuring; just a little powder, a little urine—color reaction occurs at once if sugar or acetone is present.

Galatest FOR DETECTION OF SUGAR IN THE URINE

Acetone Test (DENCO) FOR DETECTION OF ACETONE IN THE URINE

SAME SIMPLE TECHNIQUE FOR BOTH

1. A LITTLE POWDER **2. A LITTLE URINE**

COLOR REACTION IMMEDIATELY

Accepted for advertising in the Journal of the A.M.A.

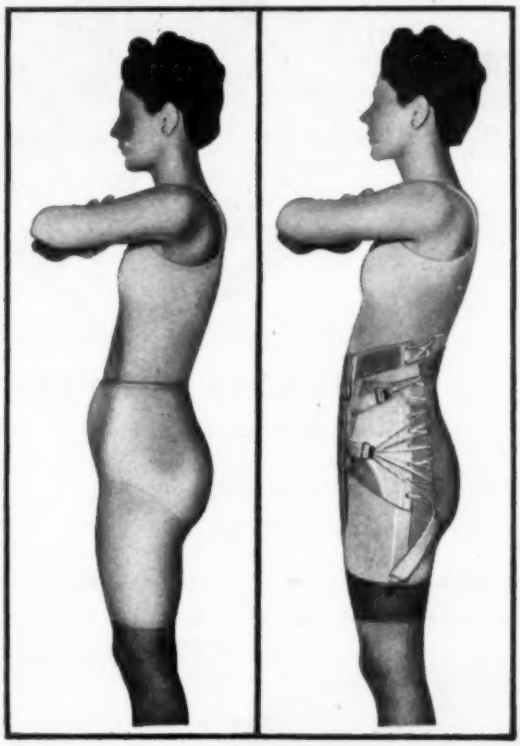
Write for descriptive literature

A carrying case containing one vial of Acetone Test (Denco) and one vial of Galatest is now available. This is very convenient for the medical bag or for the diabetic patient. The case also contains a medicine dropper and a Galatest color chart. This handy kit or refills of Acetone Test (Denco) and Galatest are obtainable at all prescription pharmacies and surgical supply houses.

Acetone Test (DENCO)... *Galatest*

THE DENVER CHEMICAL MANUFACTURING COMPANY, INC.
163 Varick St., New York 13, N. Y.

Aid in conservative treatment when the fifth lumbar vertebra slips on the sacrum



Patient of intermediate type of build; roentgenograms showed spondylolisthesis, grade 1, with congenital defects. Symptoms developed after a fall on the ice during pregnancy.

Same patient after application of support. Patient reported relief from pain which was confined to the back and called attention to the ease and comfort in the wearing of the support.

. . . advantages of the CAMP lumbosacral support

. . . ***THE WELL BONED BACK***—Curves in and under the gluteal muscles, relieving the tension of these muscles on their attachments.

Wide shaped piece of material at top (fastening in front) holds the support still more closely about the lumbar spine.

. . . ***THE SLIDE LACING ADJUSTMENT***—Assists in steadying the pelvic girdle.

It also allows for reinforcing with aluminum steels or Camp Spinal Brace.

The elastic releases make for comfort.

S. H. CAMP AND COMPANY • JACKSON, MICHIGAN

World's Largest Manufacturers of Scientific Supports

Offices in New York • Chicago • Windsor, Ontario • London, England

THE MEDICAL POWER
for Peptic Ulcer Therapy

Physicians Everywhere Are Prescribing

CA-MA-SIL

—for—

DUODENAL AND GASTRIC ULCER

Start the patient on 2 level teaspoonfuls in ½ glass of water, preferably warm or hot, both *before* and *after* each meal and at *bedtime*—also between meals if necessary.

Send for Sample

ELIMINATES BETWEEN MEAL FEEDINGS

Avoids Excessive Use of Milk

Contains No SODA, or Aluminum Hydroxide

Does not Induce ANOREXIA or cause Phosphate or Iron Deficiency

No Alkalosis or Acid Rebound

CA-MA-SIL COMPANY • 700 CATHEDRAL ST., BALTIMORE 1, MARYLAND

"This One Thing We Do"

For nearly forty years D&G has specialized exclusively in the development and manufacture of sutures. As a result the Davis & Geck line is so complete that it includes a suture of known standard and predictable behavior for every surgical need. D&G sutures are obtainable through responsible dealers everywhere.

DAVIS & GECK, INC.

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Sidamine Tablets

the amino acid tablet—uncoated—but carrying 70% protein,
no dextrose or other carbohydrate filler.

In writing for samples, please give your degree

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Cedar Rapids, Iowa

COLCIN PAN-ENZYMES NORMIN

Try This Powerful Ultra-Violet Lamp For 30 Days

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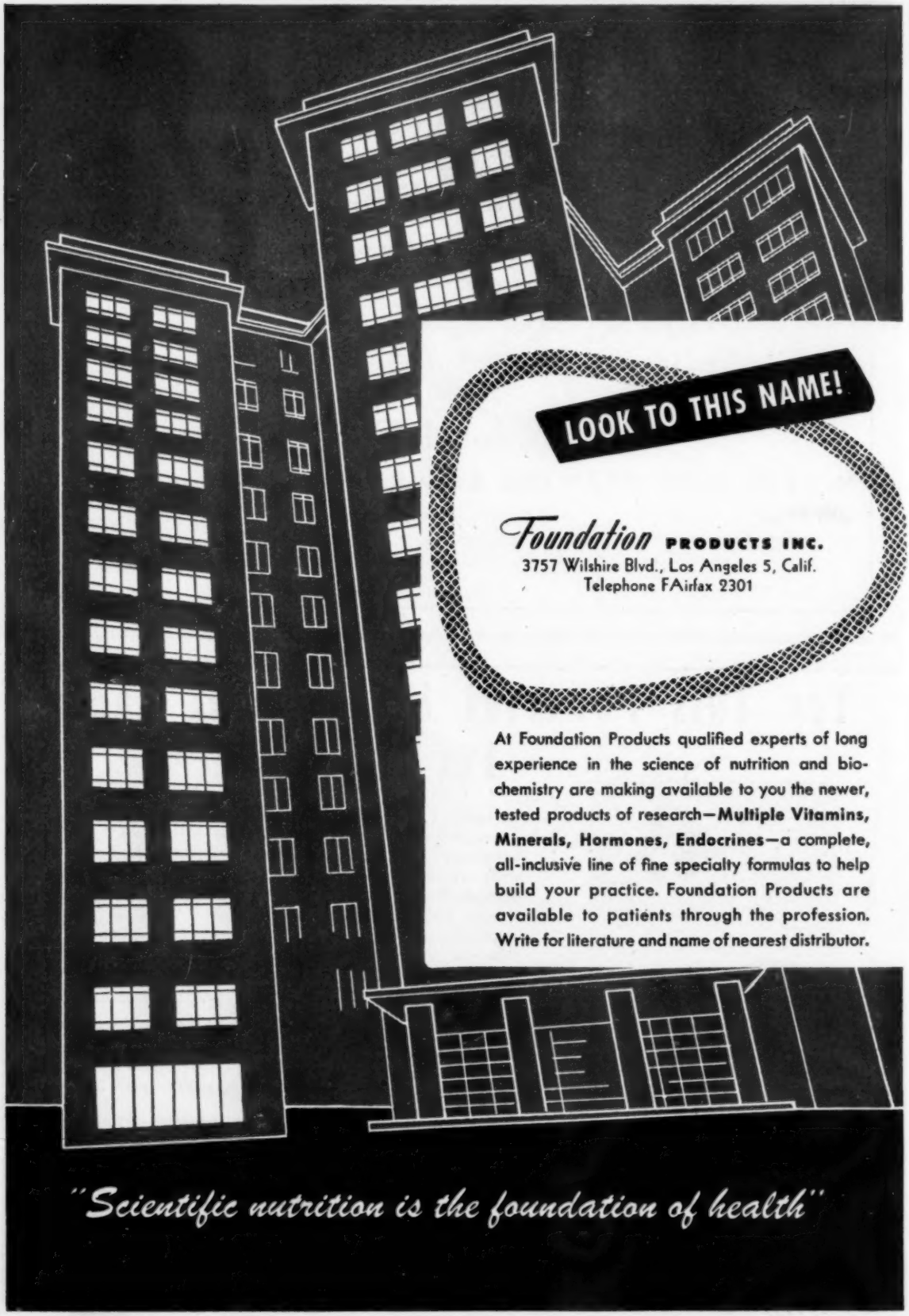
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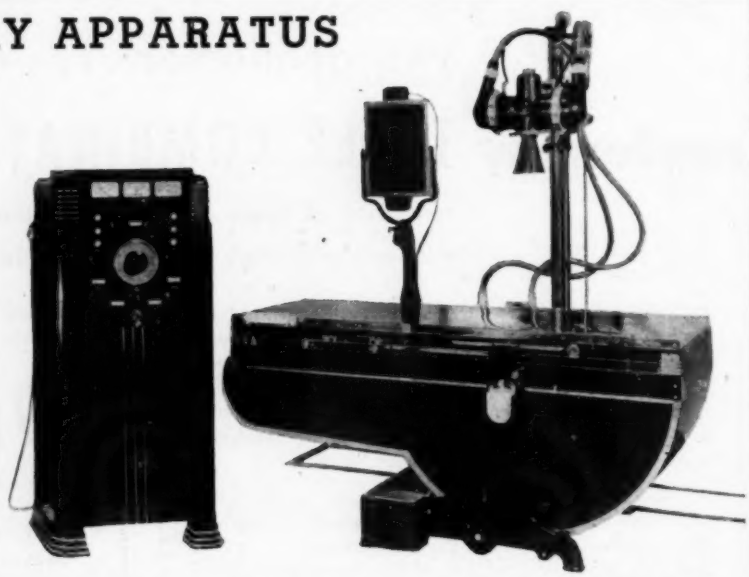

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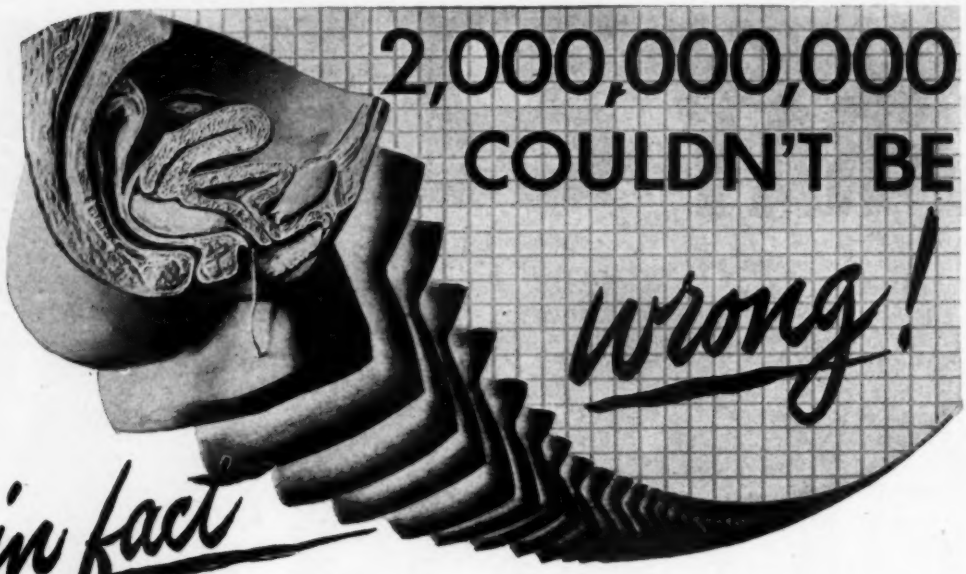

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References: 1. West. J. Surg., Obst. & Gyn., 51:150, 1943
2. J. A. M. A., 128:490, 1945
3. Am. J. Obst. & Gynec., 48:510, 1944
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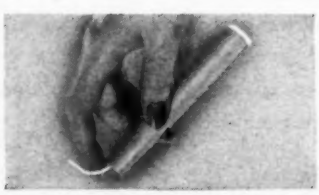

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Dynamics of Therapy*

I. Psychological Aids

ROBERT S. ROSCOE, A.B., D.O.
Cleveland

During the late war the following message was posted in conspicuous locations throughout the General Motors Plants:

> According to the theory of aerodynamics and as may be readily demonstrated through wind-tunnel experiments, the bumblebee is unable to fly. This is because the size, weight, and shape of his body in relation to the total wingspread make flying impossible.
>
> But the bumblebee being ignorant of these scientific truths, goes ahead and flies anyway—and makes a little honey every day.

At times it is advisable to be like the bumblebee and be ignorant of so-called scientific truths. During the discussion of therapy is an ideal time to take the initiative and fly, or try to fly, for only by these means shall we go ahead and fly anyway.

Dynamics denotes moving forces. We use this connotation, for therapy is, or should be, just that. The treatment administered to any individual is specific for that individual at the specific moment it is administered. It can be nothing but that. We, as physicians, are changing from unit of time to unit of time, as is the patient. We and the patient are therefore never the same. Each second, or fraction thereof, we all are different individuals. We may, therefore, say we are undergoing a constant rearrangement, even though minute, of the complex configuration of energy particles that make up our entire being. Petersen[1] said this in another manner, "Everything is in motion, nothing perishes, but all things change!" In view of these facts how can we expect to administer the same mode of therapy to the same individual on two different occasions? How is it possible to utilize the same therapeutic regime on two different individuals? In view of these impossibilities, the failure attendant upon attempting to treat "disease" is self-evident.

Therapy should be treatment of the individual, as an individual, rather than treatment of a disease. Too easily have we forgotten that disease is but a symptom-complex; hence all diseases are but an indication of a simple or complex disturbance within the individual. Rather than treat symptoms, let us attempt to find and correct the basic deviations from not only the individual's normal, but also from the ideal normal. This constitutes the art of osteopathy or the art of medicine. "A science teaches us to know, and an art to do . . ."[2]

Therapeutic attempts have left much to be desired. This may have been due to our methods of ignoring the advice of outstanding men of medical history to consider the whole, and our insistence on dealing with a part, the physical body, and that alone. Also we may have allowed the pressure of time and the fear of being unorthodox to smother what inward urges we have had to go further in aiding our patients.

The rise of psychosomatic medicine as a part of our orthodox diagnostic and therapeutic regime is of signal importance. Previously we dealt with the body alone. The study of the mind and emotions existed but was applied as a separate science. Psychosomatic medicine has and will do much more to unite the mind, or psyche, and body, or soma, so that we shall think of them and use them as one functioning and integrated unit.

One value of partial insight into temperament is obtained in aiding an individual to overcome a psychosomatic disturbance. Mentally we are scientists in obtaining knowledge of what to do. Actively we are artisans in that we merely remove or aid removal of obstacles interfering with human homeostasis. It is our duty to demonstrate to those seeking our aid how they —for they alone can accomplish it—may establish within themselves the maximum of body efficiency. Dubois wrote, "The object of treatment ought to be to make the patient *master of himself;* the means to this end is the *education of the will,* or more exactly, *of the reason.* . . . When we obey the simple suggestion of our feelings, when we let ourselves do what we want to do, we do not speak of will, although our volitions are concerned. We know very well that we are then slaves to our tastes and appetites, and we charge up this easy-going morality to our motor impulses."[3]

We visualize the individual exhibiting pure cycloid and pure schizoid temperaments, as at the two base angles of an equilateral triangle. (Again we issue a word of caution when considering two dissimilar objects as at opposite poles—this in view of spacial planes.) Therapy is directed at bringing the whole being towards a perpendicular bisecting the base line. As each individual approaches the "ideal" character, he is bettering himself and hence elevates himself from

*Delivered before the Twenty-Sixth Annual Convention of the Eastern Osteopathic Association, New York, April 13, 1947.

the base line, thus approaching a junction with his fellow of opposite temperament at the top and third angle of the triangle.

Understanding the patient's psychological pattern thus enables us almost to see him as a whole, that we may focus his attention on certain emotional aspects that would not be demonstrated during our brief contact with him. Peabody[4] has stated it thus, "Skilled physicians, gifted with peculiar insight into human nature, can often estimate a personality with remarkable accuracy in a few minutes or even seconds, but in general the more a doctor knows of his patient's background the greater advantage he has in handling the case. That is the great advantage which the general practitioner has always possessed and still possesses." Visualization of the over-all mold makes possible anticipation of character changes and trends which is desirable when undertaking this work.

Removal of psychic obstacles results in a dissolution of psychosomatic mechanisms and a relief of symptomatology, if secondary structural alterations have not developed into foci of further irritation with subsequent tertiary changes. We must, as a result of this possibility, treat the body as well, or again we repeat, the body as a whole.

Concisely, we must not ponder over a patient in an effort to determine whether his symptomatology is due to an organic condition *or* as a result of psychic factors. Correct consideration is directed at ascertaining how much of his symptomatology is secondary to primary psychic alterations and how much is resulting from organic change already present.

What do our M.D. colleagues consider as typical psychosomatic manifestations? In an article by Cobb[5] there appears a chart, compiled by systems, which shows certain pathological functions or lesions due to disruption of normal physiological functions by emotions. Interpretation of the mechanism present in some is readily evident; in others, it may seem obscure. The following are some of the conditions which have been confirmed:

Gastrointestinal System: Ulcer—duodenal and gastric; colitis—mucous and ulcerative; gastritis, dyspepsia, constipation

Cardiovascular System: Hypertension—essential; neurocirculatory asthenia, angina

Respiratory System: Asthma, hay fever, rhinitis, sinusitis, bronchitis, tonsillitis

Genitourinary System: Dysmenorrhea, enuresis, impotence, vaginismus

Locomotor System: Rheumatoid arthritis, fibrositis, neuritis, sciatica, lumbago, scoliosis, lordosis, kyphosis

Endocrine System: Graves' disease, diabetes

Skin: Uticaria, pruritus, psoriasis, eczema, neurodermatitis

Eyes: Glaucoma, conjunctivitis, blepharitis

What specific means have we at hand to aid us in dealing with the constantly changing organism that applies to us for aid? "Nature heals disease," said Hippocrates.[6] The greatest force available, that which maintains the universe, is at our side. Physicians through the ages have recognized this. As Richard C. Cabot[7] wrote, "Every physician recognizes and relies on this [the healing power of nature] like a tried and trusted friend when he makes his prediction of the length and outcome of the disease in any patient under his care. His forecast is based on two elements: (1) what his medical or surgical treatment can accomplish, and (2) what nature will do." Cannon's[8] book, "The Wisdom of The Body," gives us one of the best accounts of the abilities of nature from a physiological and physiopathological viewpoint. "Homeostasis" is what Cannon calls nature's mechanisms.

Correction of emotional irritants by their removal, but more wisely by the improvement of the individual's response to them, enables homeostatic mechanisms to function better. For example, we know that harmful as well as harmless bacteria are constantly present on the skin and mucous membranes. Why do we not suffer from them? As Cannon[9] wrote, "Only when the skin is broken or cut, only when the mucous membrane is weakened or damaged, are the conditions favorable for the invasion of our bodies by these foreign enemies." We may thus largely dismiss bacteria as a causative factor in disease. As Still[10] said, they are an effect rather than a cause of disease. Their presence within the body indicates a break or an area of lowered resistance in the bodily integument. We should search for the site of entrance, but more important, the cause behind its development. Let us carry this a little farther for illustrative purposes.

A break in the skin may have been sustained in an automobile accident, or a fall from a ladder. It should be our duty to investigate this individual's personality profile to determine whether or not he is in the accident-prone or accident-habit group, a medically and industrially accepted classification. If he is, why? What are we going to do about it? We are physicians and should deal with the whole man, not just the infection that may have developed in the accident-induced break in the body's protective covering.

Similarly, either accident may have been received while in a cycloid depressed or manic temperament "swing" with its attending carelessness. A schizoid temperament exhibiting indifference towards the world may have resulted too in carelessness and subsequent accident. Hyperglycemia or extreme hypoglycemia with attendant diabetic or insulin-shock mechanisms may have resulted in error of judgment or borderline coma and thus the accident. Desire to avoid an examination, attendance at an undesired social affair, an unpleasant day at the office, or the unconscious desire for punishment when firmly rooted in the subconscious mind often result in involuntary actions leading to accident or sickness. Speransky[11] said, "We think with every cell of our *body*. As a consequence, unfavorable emotions poison the very cytoplasm of the cell." Thus emotional tensions may bring about a decreased local resistance, offering opportunity for micro-organism invasion.

In a like manner a Still or osteopathic lesion may decrease or increase, through the vasomotor pathways, the blood supply to a given area with resultant ischemia or congestion and a localized lowered resistance. Searching for the "causative agent," can we become mentally idle upon discovery of the osteopathic lesion? What produced it—posture, chronic strain, acute trauma, emotional tensions, visceral afferent impulses? To qualify as true physicians we should not dismiss the patient lightly. We all know that lesions frequently recur after normalization even though the patient remains asymptomatic. Should we not seek the maintaining cause and attempt to remove it? Whatever the mechanism, bacteria on the external surface may then find themselves resting against an unsupported wall

and conditions are temporarily favorable for their active invasion.

Observation of animals when angered demonstrates a flexion of the spinal column with the apex of the convexity posterior in the region of the eleventh and twelfth thoracic and first lumbar vertebræ. Not only does this enable them to secure better footing for increased mobility in the ensuing action, but also we believe it stimulates adrenal action. Visceral afferent and efferent stimuli carried over the autonomic nervous system to and from the adrenals leave the cord in the region of the eleventh and twelfth thoracic and first lumbar segments. Viscerosomatic reflexes would thus be established at this area of the posterior lateral columns of the spinal musculature. Muscle contraction results.

In the human, a constant source of irritation, insufficient to bring about this major action, may tend to induce irritability of the spinal musculature at this point. Continued over a long period minor strain or trauma involving the musculature in this area when superimposed may serve as the "straw that broke the camel's back" with resultant spasm and the development of a so-called lumbago. For partial confirmation we can recall the tensions experienced in the lower thoracic areas following periods of mental and emotional stress. May this then serve in part as an explanation for the development and maintenance of some osteopathic lesions? We believe that it does open an avenue for investigation as therapy directed along this line, when carried out through patient cooperation, has been successful.

We have found that many of our patients complaining of difficulty in sleeping have been able more successfully to obtain a night's rest following a day of "nervous tension" by lying face downward on a relatively soft bed. This tends to inhibit adrenal action through relaxation of the spinal musculature by creating a mild concavity posteriorly.

We do not question the effects of constant fear or anger (though mild) with its attendant hypersympathicotonic effects over a long period. Can we wonder about efferent impulses from the brain voluntarily directed towards specific organs? Dunbar[13] says, ". . . even concentrating on a given part of the body, brings about changes in muscle tension, blood distribution and other physiological processes at the site where attention is concentrated." Consider the weight that statement holds! When a hypersympathicotonic or hyperparasympathicotonic state exists over a long period as a result of emotional stimuli, the importance of considering the whole individual is made manifest.

Emotional stimuli have been, and are, increasing in frequency and severity in our environment—our "modern civilization" with its many newspapers, magazines, radios and motion pictures. The constant "tension" as we see it today in the restlessness of the times, the inevitable "nervous strain" demanded by certain of the professions, business and governmental positions, create stimuli affecting modern man at an early age and in a manner tending to chronicity. These stimuli may act in any of four forms.

(1) Bombardment of the sensory centers with a cognizant response over the voluntary nervous system, and the autonomic nervous system as well. This may be evidenced as "tension," which when broken down through discontent, anxiety, apprehension, jealousy and regret, resolves to the basic elements of fear or anger or both. . . .

(2) When uncompensated for by increased relaxation and sleep, a lowered resistance to these external stimuli subjects modern man to both qualitative and quantitative increase in impulses over the [vegetative and humoral] pathways. . . . At the same time he is more liable to thin his more recent and delicate "veneer of civilization" and exhibit worry or irritation as fear and anger. A habit pattern may thus be initiated and a chain of these little basic physiological "run or fight mechanisms" started flowing over the sympathetic nervous system, with millions of inciter actions daily.

(3) More important because it goes unrecognized by the "host," is the effect of the subconscious mind. Hypnosis and psychoanalysis are scientific procedures which have proved to us that the human mind never loses an impression made upon it (excluding cerebral tissue change) although the impression may never rise to the level of consciousness. These sources of stimuli stored in what may be considered the more primitive portion of the whole mind are ever ready to rend us asunder if allowed to do so. We must consider the connection between these trigger-actuating mechanisms and the emotion centers in the hypothalamus and the immediate connection in the posterior portion of the hypothalamus with the sympathetic portion of the primitive nervous system, the vegetative nervous system. The impulses flowing over the sympathetic nervous system seek a predisposed or susceptible organ. . . . (This same mechanism may affect the gastro-intestinal system, the cardiovascular system, the nervous system, the genitourinary system, or any system so prepared by hereditary, familial, constitutional, chemical, physiological, psychological and sociological influences. . . .)

(4) In order to complicate the picture further we offer the following for consideration. Extra-sensory perception, telementality or telepathy, as well as prevision, have been proved actualities by Rhine and his associates in the Parapsychology Laboratory at Duke University. . . . Thoughts are something—we know not their substance. They are transferable. They are not limited by the horizon nor are they necessarily carried on a directional beam. They are, therefore, moving through space in some form from a sending mechanism in a human being and are capable of being received by the receiving set in other human beings. As each human being contains a receiving set (whether aware of it or not) consider the infinite number and types of stimuli to which we are constantly subjected and their possible effects upon the human body as carried over the primitive nervous system.[22]

The complexity of these intrapersonal psychic tensions is exceeded only by the multiplicity of ramifications of their somatic manifestations.

Crookshank[14] proffers the following: "I often wonder that some hard-boiled and orthodox clinician does not describe emotional weeping as a 'new disease', calling it *paroxysmal lachrymation*, and suggesting treatment by belladonna, astringent local applications, avoidance of sexual excess, tea, tobacco, and alcohol, and a salt-free diet with restriction of fluid intake; proceeding in the event of failure, to early removal of the tear-glands." This is an excellent description of an organistic approach to a psychosomatic disorder.

Fear is always fear of the unknown. The solution is either knowledge or faith in one's individual philosophy. Sir William Osler[15] in speaking to the students at Yale University said:

Every man has a philosophy of life in thought, in word, or in deed, worked out in himself unconsciously. In possession of the very best, he may not know of its existence; with the very worst he may pride himself as a paragon. . . . it is not the experience itself which harms a person; it is that person's reaction to the experience which causes the damage, and your basic philosophy of life determines how you react to experiences."

We meet the effects of fear constantly in our daily practices. Not the person wide-eyed, perspiring, shaking, and exhibiting tachycardia because of an automobile accident, but those in which small, usually well-hidden fears, are constantly bombarding their nervous and endocrine systems with stimuli day and night. What clinical condition exhibits such a mechanism?

For example, Lewis[16] believes that "Exophthalmic goiter . . . is what one might call structuralized fear—the constant flow of the river of emotion has cut its channels definitely in the structure and functions of the tissue." All the symptoms of Graves' disease—chemical, physiological, and psychological—are the exact duplicates of those of fear. This aggravated form of an anxiety neurosis, according to Lewis, is not solved by either medical or surgical procedures. True, the symptomatology is relieved, but will the basic cause of the anxiety neurosis find some other means of expression? We believe that it will.

In their lesser forms, fear and anger may exhibit orthopedic symptomatology. Upon superficial examination this appears to be an overenthusiastic application of psychosomatic thought, but more comprehensive examination of the matter raises questions difficult to answer.

Thought of an action produces actual fine contractions of the muscular fibers involved in that activity even though insufficient stimulation is provided to cause body action—this has been demonstrated by electromyographic tracings.[17] Consider the effects of constant thoughts involving greed on the development of the musculature and osseous system of the body, not from a static viewpoint but from a dynamic one. An orthopedic surgeon has listed Dupuytren's contracture as the result.[17]

As an aid to visualization let us recall the method of demonstrating flower growth through the medium of motion pictures. Time is speeded up through the mechanism of single frame exposure at definite time intervals with the result that the normally slow vegetative growth is seen as an animal-like activity. Man too has a vegetative growth which is correspondingly slow and thus difficult to appraise. Let us evaluate this by a mental review of a patient's vegetative growth as we would see it on a motion picture film.

Let us in this manner consider some of the individuals that visit our offices: The patient with a marked upper thoracic kyphosis and a "turtle-like" neck (usually an asthmatic) presents the appearance of cringing; the sufferer with an ocular tic and difficulty in keeping the eyelids open, has only too frequently experienced one or more severe traumatic experiences, or a lifetime of the same, where they have "seen more than they can stand"; the patient with scoliosis appears to be walking through life sideways and is thus unable to shoulder the burdens of adulthood; the individual with marked kyphosis attributes it to early senility, but typifies one who has been weighed down with "life's burdens." Even torticollis with its lay appellation of "stiff-neck" gives us much to think about. Study of our patients through these new glasses often presents us with interesting possibilities. Proper questioning only too frequently confirms these startling additions to our diagnostic and, of necessity, therapeutic regime.

The frequent contact between the hands of the osteopathic physician and the body of the patient is another therapeutic mechanism which many of us are liable to overlook. Some years ago Crile[18] and Lakhovsky[19] advanced the theory that man was a radioelectrical mechanism giving off radiations of a microwave length.

All living matter, including man, is, as a result of its construction, a radioelectric mechanism. Energy particles in complex arrangement are the basic structure of the cell. The nucleus of the cell is comparatively acid, the cytoplasm is comparatively alkaline. A semipermeable membrane separates the two. The cell is, therefore, a bipolar mechanism, an electric battery, with the nucleus being the positive element, and the cytoplasm the negative element. As the rate of oxidation in the nucleus is greater than that of the cytoplasm an electric tension is created in the nucleus which as it increases passes through the nuclear membrane, the potential thus falling and the current being interrupted. Oxidation, radiation and other chemical activity restores the potential immediately, with the result that an interrupted current passes continually from the nucleus to the cytoplasm with production of a charge on the cell membranes. This has been demonstrated and measured.[18]

With the cell membranes thus acting as the plates of a condenser we have fulfilled the requirements of an oscillator. An oscillator emits radiations. Dead plants and animals give no evidence of oscillation and hence no radiation.

Lakhovsky believes that[19] "the fight between the living organism and microbes is fundamentally a 'war of radiations'. If the radiations of the microbe win, the cell ceases to oscillate and death is the ultimate result. If, on the other hand, radiations of the cell gain the ascendant, the microbe is killed and health is preserved. Broadly speaking, health is equivalent to oscillatory equilibrium of living cells while disease is characterized by oscillatory disequilibrium." In the light of our new physics by which we know that the body is composed of particles of energy in constant motion, this theory is given added support.

Denslow,[20] in his study of the Still or osteopathic lesion, has demonstrated a change from the normal in electromyographic tracings in the area of a lesion. We may say that there is a change in the electrical field. An electrical field emits radiations. Release of muscular tissue tensions as carried out in osteopathic manipulative therapy tends to normalization of the blood supply to the area. The erythrocyte, like all cells, is an oscillator. Normalization of osseous tissue lesions not only reduces local mechanical humoral congestion but is an attempt to normalize impulses over the various nerve pathways. We know that nerve impulses are electrical in nature. Manipulative therapy obtains its results by aiding in the institution of cellular stability and hence resonance. We may thus see that we are probably utilizing an additional form of energy than is generally admitted. Possibly the reason so many patients say they feel better after but a few seconds of actual manipulative therapy is in part the functioning of this mechanism. The patient's imagination has been receiving the credit for this result.

Let us stop for a moment and consider the following. Many patients come to us tired and fatigued, and after osteopathic manipulative therapy, feel "pepped up" and "refreshed." A similar manipulative procedure will "relax" and "ease down" a tense individual. Academic training explained this on the basis of the tendency for the body to return to the normal. However, have you noticed that frequently when you are tired and fatigued before rendering treatment and "relaxing" the "tense" individual, you feel refreshed afterwards; likewise, you often feel fatigued, if only temporarily, after "pepping up" a tired individual. A record of the people treated who presented symptoms

of fatigue against those presenting symptoms of "tension" during a day's practice is often interesting to survey after deciding at the end of the day whether you are tired or stimulated. This knowledge is of value when attempting to stimulate a patient when we are fatigued, or when greatly stimulated, attempting to thoroughly release the tensions from a likewise stimulated individual.

We have in a rambling way discussed briefly a few thoughts relative to the psychological, endocrinological, constitutional, neurological, chemical and biophysical factors and their interrelations in man.

We issue one word of caution which serves as recognition on our part of the possible dangers of many of the factors discussed in this paper; we must not overstress mind and neglect the body. Mental or emotional factors may initiate and be the causative and maintaining factors of structural change, which when once created may continue without further stimulus. Likewise this structural change may be the focus for further structural change, and it must be dealt with.

An attempt should be made to maintain full recognition of the body as a whole, with a continual effort being exerted in the direction of obtaining the basic disturbing factors present in order to eradicate them, while at the same time attempting to establish the maximum of body economy with what is present to so do. It is a task worthy of our full spiritual, mental and physical capacities.

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II. Your Glands and Your Emotions

(A PRELIMINARY INVESTIGATION)

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For a number of years I have been interested in the study of endocrinology, and in that time I have been impressed with the consistent patterns of behavior which accompany certain glandular syndromes. Naturally the glandular study necessitated more concise information concerning the nervous system and its relation to the function of the endocrine chain. This study, though informative, was not satisfying because most of the activity could be traced back to the hypothalamus, but I thought there must be some other factors that excited the hypothalamus to function. Then came the study of the cranial concept which made it possible to understand the effect that restricted cranial respiration produced on the nervous system and the hypothalamus in particular, but again there was not sufficient reason for the various clinical responses produced in the patients. Psychosomatics, psychochemistry, and yes, even metaphysics were studied. This approach went a long way towards arriving at a solution to the problem. It was interesting to note how many investigators had been up against similar obstacles in their studies and had finally come to the conclusion that the body is influenced by changes in physiology, but that the psyche is most important in the causation of disease. Some investigators like Crile, Cabot, Bailes, and Alexander even pursued their search to the point that they were willing to infer that man was not the thinking individual he was supposed to be, but rather that he *felt* more than he thought. In other words, his emotional reactions way out-balanced his ability to effect rationally his behavior by thought processes.

At the present state of this investigation I have been unable logically to go farther back in disease causation than the influences of man's emotions on his body.

We all have some information pertaining to the endocrine glands and their effect on the body, but we really know much less from a factual viewpoint concerning the effect that the emotions have on the endocrine system, and, again I say, this knowledge will have to be increased before we will be able to approach intelligently the formation of a true theory of practice. Paracelsus made a statement over 400 years ago to the effect that doctors treated symptoms but only physicians treated the patient; and again, a year ago Fox[1] was even more outspoken when he wrote that a "quack" is a doctor of any school who treats symptoms instead of cause. These men and others awaken us to the fact that we still have a long way to go to the true cause of disease.

Before we can discuss the effect of emotions, we need to have a true understanding of what the separate emotions are. Love, understanding, joy, ambition, interest, and excitement are all emotions of a positive character, while fear, anxiety, confusion, and hate are all negative emotional reactions.

Obviously only the positive emotions are of any anabolic significance, but even these are not sufficient

to produce a state of well-being if the catabolic negative emotions are not first eliminated.

All of the sources of information consulted by the writer agree on one point: That negative emotions never affect the intellect alone, but always produce destructive physical changes as well. These are nervous in origin at first, but after repeated channelization they become actually physical. If sufficient understanding and corrective action is not undertaken on the part of the patient, these physical changes become constant and ultimately irreversible. Cancer and arthritis are given as examples of this conclusion.

On the other hand, positive emotions are true stimulators of endocrine activity. The glands will react automatically but only when the original excitation has been of an emotional nature. The glandular system becomes the secondary source of body energy and as a rule does not function at its peak. This peak response usually is reserved for states of emergency. However, in hyperthyroid and hyperadrenal states the individual will normally have excessive energy and will produce changes that would be considered peak reactions in individuals with other glandular patterns. None of these individuals should knowingly allow apathy, dislike, and other forms of negativism to destroy their interest and thereby affect their hormone supply.

The glandular system is known to be the physiological means through which reactions and physical energy are manifest; however, the emotional patterns of an individual are found to be the motivating force, or "trigger-mechanism" that allows the glandular activity to be released. To elaborate on this statement: The glands, in cooperation with nerve centers as in the hypothalamus, epithalamus, and corpus striatum, represent the highest form of physical tissue capable of actuating the physical system. Therefore the response to this release of kinetic drive, when registered in the gland, produces activity within the nervous system of the organism which is recognized as that nebulous thing we call the subconscious mind. From the subconscious mind is released the stimulus which motivates the emotions.

It is possible to deduce from this activity a continuous process of stimulus and response in which the glands stimulate the nervous system to release emotional drive which in turn reactivates the endocrine chain to a further release of stimuli thereby completing a cycle of responses.

This psychochemical process when translated into usefulness indicates the interrelation existing between autonomic activity and the glandular responses of the individual. This activity, when regulated and transmitted into an orderly pattern, can be translated into directed action. The practical value of this activity is found in the application made of the secretory composition of the individual, to an arbitrary standard of measurement, so that it is feasible to predict with some degree of accuracy what his physical, mental, and emotional make-up will encompass. This knowledge will aid in the further interpretation of his activities, tastes, hobbies, idiosyncrasies, and even disease tendencies.

I do not think it is unreasonable to hypothesize that endocrine reactions are to the conscious mind what the emotional reactions are to the subconscious mind. In other words, the combined activity of the endocrine glands makes it possible for the individual to respond in such a manner that he can actually make decisions and settle states of conflict arising out of conscious mental effort, and likewise he will be able to affect subconscious responses through emotional activity. It is highly important that the physician as well as the patient realize that such activity is possible, because with competent direction both the subconscious and conscious phases of the mind will be so regulated that psychological and physiological activity will not be of a detrimental nature.

If these statements prove to be true, then the past reaction patterns of an individual are indicative of two things, his glandular and nervous inheritance, and what use he has made of that inheritance, or, in other words, how he has recognized and controlled his emotional reactions.

Regardless of our school of thought, we are always brought back to the same conclusion that it isn't always so much what we have inherited, but what we do about it.

I believe it is important that we know enough about our subconscious activity to be able intelligently to question our natures, analyze our emotions, direct our rationalizations, suspect our prejudices, and thereby understand the reasons for our conduct.

No patient is likely to release his insured pain or diseased state unless another more perfect substitution can be made. This substitution can only be made through the acquisition of sufficient knowledge concerning the cause of his pain, and this knowledge is dependent upon the recognition of his emotions and the effect they produce on his glandular system, which in reality represents his life and its action.

In all the complexes that an individual falls heir to, it is the state of the emotions of that individual and not the fault of his reason that allows the conditions to exist. Man does not primarily reason, he feels. Proof of this statement may be inferred by the conclusions of Wiess[2] that it is a four to one chance that illness starts as a result of an emotional upset. I contend that no thinking individual would tolerate such a condition.

In preparation of the following material it has been my routine for the past 2 years to record on the case history card, along with my endocrine interpretation, my first reaction as to the patient's temperament —whether it is cycloid or schizoid. Any little outstanding mannerism or emotional reaction which is shown at the first consultation is also noted. There is no attempt to be authoritative in these statements; my only desire is to stimulate others to adopt some routine observations and report them so that all of us may be able to understand and care for our patients adequately.

THE PITUITARY-CENTERED INDIVIDUAL

These individuals constitute our most perplexing cases from the standpoint of emotional reactions. Not only are their different emotional patterns formed by both the anterior and posterior portions of the gland, but also the interrelation of the whole gland to the rest of the endocrine chain is so extensive that there appears to be true pituitary emotional reactions and reactions that originate in other glands and reflexly manifest their activity through the emotions that have been thought to be peculiarly pituitary in origin. The hypothalamic centers of emotional response are so closely aligned with pituitary response that some of the higher refined emotional thought patterns of nerv-

ous origin derive their stimulus through pituitary action.

The *hyperactive anterior-pituitary-centered individual* has a basic schizoid temperament with more than average intellect. This intellect is manifest through constructive judgment in most lines of endeavor, as well as the manifestation of creative energy and memory development. These individuals when possessed of adequate thyroid-adreno-gonadal balance will exhibit good family instincts and will have courage and stamina in more than normal amounts. However, females will be deficient in normal maternal feelings and will tend to have masculine traits and reactions. A member of the pituitary-centered personality group will become more capable of good and creative work after a diminution of gonadal activity has taken place. This is thought to be due to the adrenals falling into their intended relation instead of contributing to the gonadal needs. These people will constitute a portion of those patients who are neurotic, not to the extent found in the adrenal- and thyroid-centered cases, however. Their neurotic tendencies are those of vague headaches, muscular cramps, precordial discomfort, and gastrointestinal distress. A feeling of fatigue even without cause is a frequent complaint. They are positive in their beliefs whether right or wrong, and are exceedingly out of patience with the physician who does not wholly agree with their ideas. I believe that of all the true glandular types, these patients are the most opinionated. They have the unhappy faculty of wanting to domineer any and all situations with which they are concerned. Naturally, these attitudes of behavior lead to many varied emotional reactions and responses in which the individual will become the loser without proper guidance.

The *hyperactive posterior-pituitary-centered individual* will also have a schizoid temperament, but the intellect gives way to feelings in his case. These are people with average or above average mentality, but their basic drive is lacking and they are given to periods of depressive inactivity. These are the individuals who are continually planning to excite themselves into action but fall just short of ever doing anything about it. These individuals usually appear and react in an effeminate manner even though endowed with a seemingly adequate adreno-gonadal balanced morphology. The females are fortunate in this respect for they will have the true maternal instincts but nevertheless will be found to be deficient in drive, both emotional and physical. A constructive imagination is present in cases having a relative balance between both the anterior and the posterior portions of the gland, because in these individuals a state of balance is more likely to exist between their emotional and thought patterns. However, when the early life experiences have been inadequate and conditions of inferiority have taken place, the emotional balance is usually upset in later life.

The *hypoactive anterior-pituitary-centered individuals* are smaller in stature and not fully schizoid in temperament. They are given more to lethargy and apathy with moody tendencies. Their physical as well as their emotional drive and stamina are lacking. They lose control and weep when stimulated to action because of their feelings of inadequacy. They are not able to concentrate readily or carry through on projected lines of action.

The *hypoactive posterior-pituitary-centered* individual is of tall, slender build, similar to the classical picture of a eunuchoid individual. These patients are truly effeminate in appearance, but have more pronounced development of both extremities than do the hyperthyroid or hypogonadal individuals. They have extreme emotional unrest; they are quiet and unobtrusive and do not fall into the troublesome category from the standpoint of treatment. They are the typical dreamers. When hyperthyroidism is associated with this type of personality, a condition of pituitary cachexia will often ensue.

I firmly believe that the more knowledge of the pituitary gland and its activities the investigator has at his command, the greater will be his understanding of the correlation existing between the endocrine chain and the emotional patterns in any individual case.

THYROID-CENTERED INDIVIDUALS

These people are probably the most easily recognized of all the endocrine types because their symptomatology runs true to form. In the *hyperthyroid-centered individuals* a schizoid personality is usually present, and with this type of reaction pattern is found extreme nervous excitability, both physical and psychological. They are active, energetic, and susceptible to shock, worry, and grief. They have the ability to detect fine degrees of feeling, but this ability often leads to their downfall when they subconsciously or consciously refuse to accept and understand these feelings. Thyroid secretion in sufficient concentration is essential for full development of higher consciousness and psychic power as well as for normal systemic reaction. The thyroid gland is essential in maintaining the mineral balance of the body, especially of iodine and phosphorus. In the maintenance of the mineral components it reflexly affects the electrical conductivity of the system. Most hyperthyroidism is secondary to pituitary and gonadal deficiency and this statement should always be remembered when attempting to institute therapy. Patients who present an asthenic morphology and emotional disturbances usually have some secondary hyperthyroidism whether or not it is recognized.

The *hypoactive thyroid-centered individuals* are short with generalized obese tendencies, and when the condition is severe patients will be lethargic and given to states of melancholia. With insufficient thyroid secretion there can be no true physical or mental unfoldment, no complexity of thought which precludes any ability to meet adequately or to cope with the emotional changes that are bound to occur. I have long been of the opinion that most cases of clear-cut hypothyroidism are the result of generalized endocrine fatigue in which the thyroid finally gives up in its attempt to create a balance between the other glands. Cases of repeated pregnancies in which no attempt has been made to support the thyroid and its activities ofttimes bear out this statement as do some cases of a postmenopausal nature. Their typical emotional reaction is one of utter fatigue. They don't even care to react or even want to get well as a rule.

ADRENAL-CENTERED INDIVIDUALS

These individuals have a great deal of energy and drive; they are as a rule short and heavily muscled and have definite cycloid temperaments. They have stamina to carry them through nearly all of life's experiences, but they have the unhappy faculty of not knowing their limitation and consequently will exhaust themselves. In intelligence and sensitivity they are only surpassed by thyroid-centered people, but their inher-

ent moody reactions have the tendency to inhibit their vital potential. Of all the cycloid-like individuals existing in the endocrine emotional sphere, I believe these people represent the extreme in both euphoria and depression.

The *hypoactive adrenal-centered individuals* are those who have extreme neuroticism. They are as a rule of slight build with a predisposition to asthenia. They show exhaustion and confusion both physically and emotionally. As a rule they believe they are the most misunderstood people on earth. Those who are not just out-and-out pessimistic attempt to convey the impression that they have nothing that bothers them, but their history reveals consultation with one doctor after another with only transitory relief of symptoms. They are hardest to reach through psychosomatic technics because of their utter refusal to allow themselves to have either physical or mental peace. They have to be classed as cycloids, but usually they are in the depressive phase when they seek consultation. Low thyroid and gonadal concentrations act as predisposing causes; there is an unsuccessful attempt on the part of the organism to produce enough adrenal activity to overcome the other glandular inadequacies. Perhaps their immature emotional reactions and their utter selfishness can be advanced as a reason for their inability to concentrate and retain facts.

THE GONAD-CENTERED INDIVIDUAL

Gonad-centered individuals are those having a fairly normal morphology — well balanced from the standpoint of average pituitary, thyroid, and adrenal activity. They will be dynamic, creative in their relationships and work, kind in their actions, and will have sufficient ability, both physical and emotional, to carry out any project undertaken. As a usual thing they are liked and understood by most everyone. Let alone they usually understand that a balanced existence must embody physical, emotional, mental, and spiritual development, and they bend every effort to acquire it. They are cycloid in temperament but not to the extreme found in adrenal-centered individuals. They find their normal point of tolerance for the expenditure of physical and emotional energy sooner than adrenal-centered individuals. I believe their fortunate development is the outgrowth of the aggregate subconscious intelligence of the entire endocrine chain. As mentioned before, the male having a predominant anterior-pituitary-thyroid-adrenal development makes the ideal well-developed and well-balanced individual, while the female should present a posterior-pituitary-thyroid-adrenal development. One of the outstanding symptoms of this state of existence is the extremely fine tone of the skin and muscular layers of the body.

The *hypoactive-gonadal-centered people* are of tall stature and asthenic appearance with inadequate physical and emotional stamina. These cases are different from the standpoint of pituitary stimulation and consequently have none of the attributes of appearance or reaction that characterize the well-developed and adjusted personality. They show inability to grasp and understand even physical reactions let alone higher forms of mental activity. By the time they have become hypogonadal it is safe to assume that the entire endocrine chain has suffered from the lack of normal inheritance. The chemistry involved here is of interest insofar as eunuchoid individuals are unable to maintain normal calcium and phosphorus balance.

THYMIC-CENTERED INDIVIDUALS

The *thymic-centered individuals* are those in whom the thymus has not normally atrophied at puberty. Reasons for this failure may be due to inherited predispositions to enlarged thymus or inadequate gonadal development which in turn may be affected by insufficient developmental activity on the part of the pituitary gland, the anterior portion in particular. These individuals present an immature childlike appearance that usually will simulate hypothyroid or hypoadrenal cases. These patients lack physical and emotional stability; however, the body and mind are highly reactive to external stimuli even though it is as a rule not consistent with the average behavior patterns. These are the individuals who often succumb to homosexuality and present further social inadequacies such as lying, stealing, and an utter lack of moral responsibility. It is only natural that with this much tendency to emotional turmoil that they should be susceptible to allergic states and diseases arising out of hyperlymphatic changes. Though of a cycloid temperament there are definite states of schizoid activity manifest in some cases. They are misfits in the truest sense of the word. If they are fortunate enough to inherit some balance between the anterior pituitary and the thyroid gland, they may have a flair for artistic endeavor and show a seemingly brilliant side of their personality, but even this is eccentric when observed over a long enough period.

There is some question in my mind as to whether there exists a true *hypothymic-centered case,* because as thymic atrophy is desirable at puberty and as the other glands do not reach their peak of development until that time, I am inclined to believe that any manifestation of deficient thymic activity is normal, especially when this atrophy takes place at the proper time of development.

EMOTIONS AND DISEASE

It is my conviction that as physicians of a separate school of thought we must have something better to offer in the art of therapy to justify our existence. We know from the scientific literature as well as from diversified reading that the therapeutic approach to health is far from scientifically honest, let alone effective. Suppose some morning our car refused to "get up and go to the office," and we called a "doctor of motors" only to be told that there was something out of adjustment in the carburetor or in the ignition system. We would be put out, to say the least, if the "motor doctor" took off his coat and started to polish the fender. Yet we go to our offices and we take off our coats and start in "fender polishing" all day. We act hurt when someone makes a disparaging remark as to our proficiency and sincerity. This is a crude comparison. But is it? We need truly to analyze ourselves in order that we may be more fit to attempt to aid others. Why do psychiatrists have to undergo analysis before they are certified as specialists? The interested honest investigator cannot refuse to accept the theory that our emotions are the seat of most of our disturbances, and the big task that confronts each and every one of us is to realize this truth.

Landis,[3] in an article in *School and Society* made the following statement: "Strangely enough, not many physicians are aware of, or concerned about the condition of unhappiness. Unhappiness, so much thought of and talked about as an acute emotional

state, has never been recognized by physicians as a pathological entity, either curable or incurable. I believe that the study of unhappiness as a disease-provoking element, as a disease in itself, or as a clue in the search for disease should be systematically undertaken." This is just one emotion. It doesn't take much imagination to realize the scope of emotions or the extent of human activity they influence. The point I want to make is that the true diagnosis of functional illness can be made on its own characteristics, and that it is not essentially an absence of organic disease. In other words, when emotions are allowed to assume their full stature, we find that they become neurovisceral reverberations of a motor nature, that are related to events which are associated with two important values of existence, namely, pleasure and pain. By reaction on the central nervous system they are remembered and desired or remembered and avoided; through this process they are able to influence enormously the individual's intelligence and conduct. I don't think it is unreasonable to assume that emotions represent the sensory side of both instinctive and intelligent activity. It is even feasible to weave the emotions into patterns of personality and use these patterns in attempting to understand the mental structure of the individual who has been created by glandular inheritance and influenced by subsequent environment.

How does this tie in with physiological glandular activity? Hormone activity is stimulated by two means: (1) chemically and (2) emotionally. This stimulation will be beneficial if the endocrine and nervous systems are "in phase" to receive normal secretion. If the individual is upset, then any chemical or emotional stimulation results in physiological changes which in turn result in adverse emotional reactions. One step further—we find that nearly all true glandular disturbances are the outgrowth of the process in which repeated subconscious release of hormonal secretion allows the body physiology to be so conditioned that subsequent channelization of the secretory systemic response results in true glandular changes.

Fatigue states are merely the outgrowth of ignorance in which the organism is subjected to serial stimulations both chemically and emotionally beyond the point of comfortable tolerance. This leads to the basic destructive emotion which is fear. Fear is usually found to be the subconscious maturation for the fatigued state. Inner conflict and anxiety are factors that are more superficial and thereby more readily understood, but *fear* is the true basis of most fatigued states.

The endocrine chain is responsible for the development of personality, but the rational use of emotions towards the development of a composed mentality is responsible for individuality.

I have no desire to dwell on the catabolic emotional processes, but I am vitally concerned with the formation of technics which enable me to convey to the patient the mechanism whereby they, in turn, will be able to alter and utilize their emotions in an anabolic manner.

I am convinced that nearly all of the conditions of malfunction take their origin in early childhood and that for the most part they are the outgrowth of two subconscious elemental drives: the need for a feeling of importance and the expression of sex. These drives when matured and refined take on the role of attainment and love so it becomes apparent that they are always needed, but the manner in which the individual works them into his pattern of reality constitutes the amount of balance and understanding with which he endows himself. In all the complexes he finds himself, it will be the emotions and not reason that is the cause of them.

Again with the information available from an endocrine diagnosis of the individual, it becomes easier to understand the patient's probable reaction to life situations, the tendency towards anxiety states, and the nature and seriousness of the conflicts he is liable to encounter.

Along this line it is interesting to note the "symbolism of symptoms" as pointed out by Weiss and English.[4] Patients were told that if an outlet is not found for tension of emotional origin, the body finds a means of expressing this tension through a kind of "organ language." For example:

1. Swallowing: If a patient cannot swallow satisfactorily and no organic cause can be found, it may mean that there are life situations which the patient "cannot swallow."

2. Nausea: In the absence of organic disease, nausea may mean that there is some environmental factor which the patient "cannot stomach."

3. Feeling of oppression in the chest: Such feelings may indicate that the patient has a "load on his chest" which he would like to get rid of by talking about his problems.

4. Muscle tension giving rise to sharp pains, such as atypical neuralgia, may be caused by "focal conflict" as well as "focal infection."

These are but a few examples, but suffice to say their relative truth is astounding.

Our primary object in approaching therapy is to attempt first to instill in the patient a *desire* to get well. One means towards this end is to help the patient to understand the meaning of his symptoms and the nature of his conflicts. This constitutes an approach to a process of re-education that when properly applied should stimulate sufficient emotional development so that the necessity for symptom formation is obliterated.

There have been various methods worked out for re-educating the individual. Some of them are complex, and some are inadequate. I personally am in favor of short, pointed methods as the individual's need for repetition of the plan will allow for easy remembrance. A method I have found highly satisfactory in my practice follows:

1. To forgive and thereby release and overcome devitalizing emotions.

2. To ask to be forgiven. This creates and constructs vitalizing emotions.

3. To acquire a philosophy of life through the application of a universal love.

4. To screen out and insulate oneself against further irritation—so enabling a fuller understanding of the law of cause and effect.

5. Then finally and most important—to "relax and let go" and enjoy the balance that has been achieved.

Naturally this method seems sterile to both the investigator and patient until further work and understanding is reached. I say this because I find that in the application of psychological methods to emotional problems the trend is for the patient to want some

rare, complicated form of healing rather than attempt to obtain relief through the expenditure of effort which embodies a concise program of emotional training.

I believe the most profound and yet the simplest observation I have made is that this idea may have to be presented to the patient from four to eight different ways before he actually makes it his own and is able to utilize it in his own behalf. He invariably hears and understands that which he is told, but it fails to register in his intellect in sufficient force to become utilized in his centers of reasoning.

The next point I try to get over to the patient is that he must spend some time each and every day in diligent concentration and effort in following the above routine, or some other routine that may suit his needs better. The point remains that for one to succeed in re-educating the "physical being," it is necessary to expend much mental effort. One of the most discouraging phases of the work for both parties concerned is for the patient to obtain remarkable relief in the early stages of treatment, then all at once to appear as bad as at the beginning of the program and to culminate everything by having a cold, or influenza, recurrence of pain, or sometimes even a state of complete exhaustion necessitating bed rest.

This condition can be handled by warning the patient at the beginning of therapy that sooner or later he will have a reaction and that he is not to resist it because it is nearly always indicative of progress made by him in the attempt to normalize his emotional disturbances. I always explain to him that the body learns slower than does the intellect and subsequently is slower in responding to mental stimuli.

You may say: "That is all well and good, but how am I to know when and what is taking place in the individual?"

My answer is that I don't know of any way one physician can *honestly* tell another how he arrives at an understanding or diagnosis, but in anticipation of such a question I would like to call attention to one bit of nervous tissue that the physician can inspect readily and, with some practice, quite accurately—that is the eye. I know of no other organ that so accurately tells the earnest investigator as much concerning both the mental and physical states of the patient as does the eye. With some practice it is possible to observe the true patient response to thought by watching the change of expression. When one makes a statement or asks a question, he should watch the eye for a true reaction regardless of any "cover up" on the part of the patient, for the eye always responds in exact relation to the extent of the stimulus that has been received in the organism. This is the one place that the endocrine chain and the emotions meet at one and the same time to activate a response of their true activity.

Now, I grant that one's success will not be phenomenal to start, because being a true investigator is something like training dogs, one must first know more than the dog! With that much of a lead, and with diligent practice diagnostic acumen will be enhanced to the point of reliability at least.

I have most of my patients read some constructive literature, the type depending on the individual and the kind of problem he has. I follow the same procedure here as in the other technics in which I request that they spend some time daily in their reading as part of their program of re-education. Their reading may start out with such books as "How Never to Be Tired," "Fear," "The Doctor Alone Can't Cure You," "Peace of Mind." As fast as they progress they are given material that helps them to realize that to succeed in their life's work they must build and understand a true philosophy of life. This philosophy should be constructed on a spiritual foundation of their own choosing, and must be of such a nature as to enable them to triumph over any and all physical and emotional storms.

At such time that the patient shows sufficient interest of a constructive nature I suggest a key which will enable him to approach and work out his problem, thus increasing his self-reliance and achieving his own mental and physical well-being. This key has two parts; the first part is divided into three sections as follows:

1. Definition of the problem at hand, or in other words, getting down to the *real* underlying cause of immediate concern.

2. Searching out of all factors that go to make up the solution of the problem, or the *truth* concerning the problem.

3. Having defined the problem and thoroughly searched out all its ramifications, this information should be applied immediately in active form to effect a full solution to the problem.

The second part of the key is also divided into three sections which have to do with the individual's personal relation to his problem:

1. Be sure that physical and emotional desires and rationalizations are eliminated from the decision that has been made.

2. Realize that the intellect itself may confuse the issue and through its wrong application further complicate the solution to the problem.

3. Understand finally that only through the realization and application of a spiritual philosophy is the physical and emotional life brought to full stability; in other words, the individual comes to realize that the self-centered physical and emotional love that he once had must be elevated and projected to his fellow man in a wholesome, fully matured manner.

SUMMARY

I have attempted to bring to your understanding the thought that even though a patient may have an endocrine system that is highly reactive and important, and though that system is closely related and highly interactive with that patient's emotional responses, the important consideration of that patient consists in something more than a knowledge of these factors. It is necessary to look upon that patient as a being in whom the mental or philosophical force can be so generated that he will be able to think intelligently and apply his new spiritual and emotional reality to his physical life according to the plan of natural law.

408-11 Reynolds Bldg.

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Symposium on Cardiovascular Diseases*

Case History

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A careful case history is essential for the thorough study of the cardiac patient. Its object should be twofold—first to reveal by careful subjective symptom analysis the pathology present and second to determine, as far as possible, its etiology.

There are a few general considerations in the taking of any history that may contribute much toward its success. Both patient and physician should be comfortable and at their ease, if conditions so permit. Sufficient time should be allowed so that a complete history may be taken. The patient should be allowed to state his case in his own words as much as possible, with the physician guiding the discussion into channels which give him the desired information. The ability to obtain information from the reluctant patient and to limit the wanderings of the voluble patient can only be gained by experience.

The form of the history is a matter of individual preference. Whether it be a printed form in which checks or circles are made in spaces provided, or a record written as questions are asked, it should consist of the patient's name, address, age, and occupation; concise statement of the patient's chief complaint; history of the chief complaint; past personal history; family history, and a review of the various body systems. An example of the advantage of completeness in a history might be one in which epigastric pain mentioned in the routine gastrointestinal history could be an important factor in evaluating coronary status, as ofttimes coronary pain is referred to the upper abdomen. The patient's age and occupation are important. The prevalence of various cardiac conditions in different age brackets might be a helpful factor in diagnosis, i.e., rheumatism in youth, coronary disease and syphilis in middle life, and sclerosis in the aged. Occupation is important from the standpoint of management; for example, a person with mitral stenosis should follow one of the less strenuous fields of endeavor. The predominance of certain diseases in various occupations is noteworthy, i.e., the high incidence of coronary artery disease in professional people, business men, and those who work under tension and mental stress.

CARDIOVASCULAR SYMPTOMS

There are several subjective symptoms that should call attention to the cardiovascular system: dyspnea, precordial pain, edema, cough, cyanosis, vertigo, syncope, palpitations, and weakness.

Dyspnea.—This is probably the chief subjective symptom of left ventricular failure. Its degree is frequently a guide as to progression and prognosis of cardiac disease. Dyspnea is frequently found in cases of cononary artery insufficiency and will often give a diagnostic lead in the so called "silent coronary attacks" in which precordial pain is minimal or absent. The following questions should be asked: When was the dyspnea first noticed? Has it become progressively worse? Has it any seasonal characteristics? Is it accompanied by precordial pain? Does it follow a heavy meal? Does the dyspnea come on exertion or at rest? Has there been nocturnal dyspnea? Is it accompanied by a cough? If so has it been productive with frothy and blood-tinged sputum? Is there a difference between the inspiratory and expiratory phase?

The differentiation between cardiac dyspnea and dyspnea of pulmonary origin can often be made or aided by a good history. The elicitation of the fact that the dyspnea is spasmatic and expiratory in nature, or that there are other members of the family with allergic symptoms, would certainly suggest bronchial asthma. The typical "cardiac dyspnea" is a progressive affair starting with dyspnea on exertion and becoming gradually worse until it is present at rest, resulting from a progressive myocardial insufficiency.

Precordial Pain.—Pain in the precordium is a frequent complaint in cardiovascular disease. In questioning a patient with this complaint the following facts should be noted: How long has it been present? Is it continuous or intermittent, sharp and lancinating, or dull and boring in nature? Is it brought on by exertion, or does it come at rest? Where is it referred? How long does it last? Is it relieved by position change? Is it accompanied by dyspnea?

Both angina pectoris and coronary occlusion are characterized by precordial pain. The pain in both is quite severe. In the latter it is usually longer lasting, not relieved by nitrites, and is accompanied by symptoms of shock.

The pain associated with aneurysm is usually a constant boring type, especially in the presence of rib erosion.

Precordial pain may be produced in acute pericarditis by concomitant involvement of the pleura by the infective process, or by the presence of a large exudate in the pericardial sac. The nature of the pain may follow several patterns: It may be a sensation of momentary arrest of heart beat, with a feeling of constriction at the apex of the heart, and accompanied by a precordial thump. This is the ordinary extrasystole or premature beat. It may be localized at the apex and exacerbated when a deep inspiration is taken. This is often seen in pleurisy involving the precordial cul-de-sac. It may be evident at the apex and radiate toward the left lateral chest wall. This is often seen in intercostal neuralgia, costochondral separation, or osteopathic rib lesion.

The pain of angina pectoris is often described as vice-like, constricting, clawing, or strangling. It extends from the poststernal area to the upper chest and may radiate to the left arm. It is usually preceded by exertion.

Precordial pain is a frequent complaint in cardiac neurosis. However, patients suffering from this condition usually will present other neuropathic manifestations such as insomnia, nervousness, emotional instability, asthenia, migraine, manifestations of overexcitability of the other systems, and evidence of autonomic nervous system imbalance.

Edema.—Edema is one of the chief symptoms of right ventricular failure. The patient should be ques-

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tioned as to its existence, mode of onset, and duration. Questioning should include careful investigation of renal status to differentiate cardiac and renal edema. A patient with a history of edema should also be questioned as to dietary insufficiencies and fads or the presence of some condition which might deplete protein reserves, such as albuminuria, and produce a hypoproteinemia with resulting edema.

Cyanosis.—Cyanosis may often be a sign of congenital cardiac anomalies. Its presence in a young patient, brought on by excessive effort or cold weather might be indicative of such a lesion. It is frequently present in congestive heart failure, coronary occlusive disease, pneumonia, and uremia.

Vertigo and Syncope.—Vertigo and syncope should suggest the ruling out of arteriosclerosis and hypertension. They are often seen in advanced mitral and aortic stenosis, coronary disease, heart block, and uremia.

Palpitations.—Palpitations are frequently a complaint in the various cardiac arrhythmias, cardiac neuroses, and endocrinopathies.

Weakness.—Patients with impaired cardiac reserve complain of exhaustion, usually at the end of their working day, and those with arterial hypertension, usually in the morning. Weakness is a common complaint in the so-called effort syndrome, anemia, and tuberculosis.

The past personal history should consist of a concise statement of past diseases, accidents, and operations. The childhood diseases, including the exanthemata and especially the rheumatic triad, are frequently the etiological background for many of the chronic valvular defects and endocarditis met with in later life. A careful questioning as to their occurrence is important in a cardiac history. It is well to inquire specifically as to the presence or absence of "growing pains." "Growing pains" probably were rheumatic fever.

The search for syphilis in the past personal history is also very important as it is a significant etiological factor in heart disease.

A patient who includes choleeystitis in his past or present history should be carefully observed for coronary artery disease as these two entities are frequently found together and may have a common etiology. Questioning for evidence of hyperthyroidism or hypothyroidism should be included as both these conditions affect the cardiovascular system.

Careful questioning as to the patient's habits and social status may be helpful. A knowledge of these factors is always important in management. It is advisable to determine what drugs, if any, a patient is or has been taking. These may sometimes be a cause of his condition. An example would be a tachycardia produced in a patient inadvertently taking thyroid in an attempt at weight reduction without supervision.

The family history should contain careful search for diabetes, tuberculosis, syphilis, and hypertension due to their familial tendencies and effects on the cardiovascular system.

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The Development of a Cardiac Diagnosis

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OBJECTIVE EVIDENCE

It has been said by internists that given the choice of either one of the three sources of diagnostic data, i.e., history, physical examination, or laboratory procedures, the case history would be the procedure of choice—the one of most value in making a diagnosis. In a general way this is probably true. Fortunately this is supposition designed to point out the superior value in diagnosis of a complete and accurate history. However, this intent to emphasize the importance of the case history must not be interpreted as minimizing the value of other diagnostic procedures.

The threshold for registration of symptoms in the human body is by nature a variable factor. Thus we have at one extreme the neurotic individual with a low threshold and easy registration of symptoms due to functional or psychosomatic mechanisms; while at the other extreme is the phlegmatic patient with organic disease, exhibiting marked tolerance of that disease before symptom production occurs. Because of this discrepancy and because by nature some cardiac diseases remain asymptomatic for years, frequently the first indication of heart disease is noted during the course of the physical examination. Many times such physical examinations are conducted because they are routine, as in job application, life insurance, entrance to armed services, etc. and not because of the presence of symptoms. Even when significant asymptomatic pathology is discovered, frequently cardiac insufficiency may be postponed for years or prevented entirely. It is becoming more obvious yearly that routine periodic physical examinations will ultimately be the rule rather than the exception and that such preventive medicine will result in a marked decrease in necessary cardiac treatment.

Examples of cardiac disease which fairly commonly are first recognized because of abnormal physical findings alone are:

1. Congenital heart disease in children, especially the acyanotic group
2. Chronic rheumatic endocarditis following subclinical rheumatic fever which was undiagnosed and for which the child was never bedridden
3. Luetic aortitis before aortic regurgitation and when the only clue is a bell-like accentuation of the second aortic sound
4. Hypertensive disease frequently of years' duration and still asymptomatic but showing early cardiac enlargement
5. Cardiac enlargement as the only abnormal finding in an asymptomatic patient. Further study may reveal myxedema or other noncardiac cause.

As the first person to be confronted with the possibility of discovering heart disease, the general practitioner must be well schooled in physical diagnosis and furthermore he must be sure of his findings. His confidence in the accuracy of his findings is reflected in his conversation with the patient. When further special diagnostic data is needed for a diagnosis, uncertainty is justified in the doctor's attitude, but unjustified uncertainty soon makes itself apparent and, when

continued, causes wrong, unnecessary, and even harmful treatment.

The actual examination to evaluate the cardiovascular status has frequently been the main cause of a cardiac neurosis. The combination of a poorly conducted physical examination and the doctor's assumption of an air of concern and perplexity plus a susceptible, impressionable patient is certain to result in some degree of anxiety and introversion regarding heart disease. Undue attention to the heart on the part of the examining physician naturally arouses the concern of the patient. When the doctor is certain of his findings and they are normal, he reassures the patient. That reassurance is effective because it is given with an obvious certainty and assurance born of experience. On the contrary when the doctor is uncertain of his physical findings and therefore shows concern himself, this will be taken by the patient as cause for worry about heart disease and frequently this is the beginning of a cardiac neurosis. Even worse than this is the fact that this neurosis will become more firmly established should the patient continue under that physician's care, following a cardiac regime. Apparently the psychological reaction on the part of the physician in such a circumstance involves a protective mechanism—an instinct to play safe when in doubt and to treat the patient as if he had cardiac disease. Thus, embarrassment and criticism will be avoided should a heart lesion be discovered later. Unfortunately this unhappy solution may backfire and a cardiac neurosis be created. Even though it is a functional disease which is created, its symptomatic manifestations are as real and disturbing as organic disease and frequently are even more resistant to therapy.

For these reasons it is obvious that the examiner must be experienced, proceed with assurance, and speak with certainty to avoid unnecessary apprehension on the part of the patient.

The development of a cardiac diagnosis may take several minutes or at the other extreme many days. A diagnosis of left ventricular heart failure in a hypertensive patient may be made in several minutes at the bedside on physical findings alone. Then again a child in bed with rheumatic fever may need to be observed for weeks to decide whether a murmur is organic or functional. A diagnosis of subacute bacterial endocarditis is made on finding a heart murmur and a positive blood culture of Streptococcus viridans. At the other extreme, a diagnosis of angina pectoris may be made on one presenting symptom even before physical and electrocardiographic examination.

Since approximately seven out of ten patients with precordial pain do not have organic heart disease, it is highly important that the examiner recognizes the high incidence of the psychosomatic, emotional, and other noncardiac factors in evaluating his findings. Proper and proportionate evaluation must be given to all noncardiac factors. The patient must be examined generally, so to speak, and not alone from the cardiovascular standpoint. Especially is this valuable when the symptom picture is not clear-cut but almost bizarre. It is of invaluable aid to be always aware of the symptomatic and physical manifestations of both the sympathicotonic and the vagotonic state. Frequently when the cardiovascular findings are negative one can find an explanation for the symptoms in a vegetative imbalance. Undetected hypothyroidism may be the cause of unusual fatigue and abnormal breathlessness when a cardiac lesion is suspected. An osteopathic rib lesion may be the main reason for precordial pain which persists even after reassurance of the patient with a cardiac neurosis.

The physician's approach to the physical examination must be an open-minded one with no positive convictions about the complete diagnosis. The actual examination is of course best conducted in an environment conducive to comfort and relaxation. The emotional factor must be evaluated and some idea of the patient's emotional status will be acquired while taking the history. The patient's apprehension about the outcome of the physical examination results in increased heart rate and blood pressure. These may be rechecked at the end of the examination and will usually be more nearly normal.

Most of the objective physical examination evidence in making a cardiac diagnosis will evolve from auscultation and percussion of the heart, determination of pulse rate, blood pressure, and respiratory rate, and search for basal lung rales, examination of the abdomen for liver enlargement or ascites and of the extremities for edema. However, data from the remainder of a complete physical examination may not only be invaluable in the diagnosis of some other noncardiac disease but may also reveal an important finding in cardiac diagnosis.

INSPECTION

The examiner is impressed mostly by skin color, facial evidence of symptomatic distress, and whether breathing is normal or abnormal. As the examiner well knows, skin color may be very deceptive. The patient with angina pectoris may have a very healthy ruddy complexion between attacks and the patient with coronary thrombosis may have just returned from a seashore vacation and may have a tanned skin and look of health. Good skin color then may be deceptive. However, the ashen white complexion of patients in left ventricular failure has an immediate significance and the rather chronic cyanosis seen in the lips of patients with mitral stenosis has pathologic significance. Generally speaking, heart disease which has impaired functional efficiency of the ventricular muscle will result in either skin pallor or cyanosis. Facial flushing at the excitement of being examined frequently neutralizes skin color and masks the abnormal finding.

Varying degrees of dyspnea in a patient at rest usually indicate some degree of cardiac insufficiency. If this be true cardiac dyspnea, it will usually be associated with pallor or cyanosis of the skin, and frequently basal lung rales will also confirm the cardiac nature of the dyspnea. When observed by the physician dyspnea has much more diagnostic value than when its occurrence is related in the history. There is a form of benign dyspnea called "sighing dyspnea" which, as the name implies, consists of intermittent sighing. This is usually indicative of anxiety and is common in cardiac neuroses. The intermittent nature and the description of the sigh are sufficient to label it "sighing dyspnea."

Some degree of practical measurement of this factor is possible in recording the vital capacity. A small inexpensive aneroid type of instrument is available for this purpose and with it is a chart of normal readings for height and weight variations in both males and females. This is an invaluable aid. When a patient complains of abnormal breathlessness and the vital capacity reading is above normal, less significance is given the symptom, especially from a cardiac viewpoint. Other noncardiac factors as obesity, neurocir-

culatory asthenia, etc. should be given consideration. Repeated vital capacity readings are of value in following the progress of a heart patient and often are of more value than an initial low reading.

BODY TEMPERATURE

Temperature readings are often not taken in ambulatory patients and this neglect sometimes is costly. More than one patient with subacute bacterial endocarditis has continued at work because a diagnosis was not made. A temperature reading of the patient with weakness, sweats, fast heart rate, and a murmur would have practically clinched the diagnosis.

Low temperature readings are the rule in patients with cardiac insufficiency. Temperature reaches extremely low levels in congestive failure in which readings of 95 F. are not uncommon. As a matter of fact, oral readings over 99 F. in the presence of congestive failure suggest a complication. Rectal readings are usually much higher than oral ones because of intense passive congestion in abdominal viscera. Low readings in patients with cardiac disease are not as suggestive of hypothyroidism as in other patients. This should be remembered because in heart disease as in hypothyroid states, patients complain of intolerance of cold, dry skin, dry hair, weakness, and abnormal drowsiness.

Pulse and respiratory rates should be recorded with the temperature. The T.P.R. (temperature-pulse-respiration) ratio varies in cardiac patients because of the tendency for temperature to be low while pulse and respiratory rate are quite high in many cases. This is not true, however, of the ambulatory patient with cardiac compensation.

PALPATION

The radial pulse and apex beat are the principal sources of information on palpation. The volume and rhythm of the radial pulse should be noted and the rhythm checked with the apex beat when abnormalities are noted. When the rhythm is regular, rates between 60 and 100 per minute are considered within the normal range. Rates up to 110 per minute are normal in children 4 years of age, and rates of 120 at 2 years of age are considered within the normal range.

Pulse volume is, of course, dependent upon pulse pressure and is a good index of vascular tonicity and left ventricular muscle tonus. Occasionally the radial artery is deeply located at the wrist and the impression of poor volume is created when in reality proper palpation is impossible.

Palpation of the cardiac apex serves to locate the apex beat and thereby indicate possible cardiac enlargement. Also, the degree of force of contraction is noted. This is markedly increased in all conditions increasing cardiac dynamics, as aortic and mitral insufficiency, thyrotoxicosis, and other lesions resulting in cardiac overactivity. Increase in pulse volume occurs in these same diseases and is decreased in diseases which lessen cardiac dynamics.

BLOOD PRESSURE

Blood pressure deviations from normal are, of course, most common in cardiac diseases. A rather wide range is recognized as normal and systolic levels of 100 which formerly were always called hypotensive are now known to be compatible in many instances with normal health and are not termed hypotension in every instance.

The outstanding disease producing blood pressure change is, of course, essential hypertension. Even before a diagnosis of essential hypertension is made, a number of blood pressure readings are necessary in many cases. Usually marked emotional reactions occur and many patients state they are "allergic" to blood pressure readings. Recently a female patient, aged 43, pregnant and hyperthyroid (basal metabolic rate, +51) with a blood pressure of 180 systolic, 50 diastolic was referred to an obstetrician for decision regarding therapeutic abortion. When examined by the obstetrician, blood pressure was 298 systolic, 70 diastolic because of anxiety over the outcome. Another patient who was a dancer and under treatment for hypertension of 180 systolic, 100 diastolic, had her blood pressure recorded immediately after her dance number. It was 300 systolic. Neither of these patients had a headache at the time of the marked elevation. Great variations in blood pressure do occur and the average normal for each patient is only found after serial readings. Diastolic readings habitually over 90 and systolic readings over 140 in patients under 50 years of age are due either to hypertension or potential hypertension, depending upon the levels. Much common sense in viewing all of the findings is necessary in borderline cases.

Incidentally, the actual taking of blood pressure frequently gives the examiner a clue regarding the threshold for registration of pain. Some patients protest loudly when the mercury is pushed over 200 mm. These patients should be further observed for hypersensitivity to all stimuli. They often are cardiac neurotics or hypochondriacs. The possibility of a superimposed neurosis on an organic lesion must always be remembered, however, lest we stress the neurosis too much.

Cardiac disease which tends to increase the dynamics of the heart usually increases blood pressure. An outstanding example of this is aortic insufficiency. Because of the diastolic recoil of blood, the diastolic pressure is markedly reduced, and as a compensatory mechanism, left ventricular contraction raises the systolic pressure. This results in the high pulse pressure typical of this cardiac lesion. A most extreme instance of this was a blood pressure reading of 400 systolic, 0 diastolic in a male patient with aortic regurgitation and marked cor bovinum. Aortic stenosis and heart block also result in hypertension. This latter type of hypertension which occurs as a result of valvular disease especially represents part of the changed physiology of the heart, and therapy should not be aimed at lowering the blood pressure.

AUSCULTATION OF THE HEART

Auscultation usually produces the most valuable data in cardiac diagnosis. Listening to the heart is so fascinating and so informative that, unfortunately, this part of the examination is too frequently the only approach used by the physician. Another error commonly noted is listening at the mitral valve area alone and, if no abnormalities are noted, declaring the heart normal. All valve areas should be auscultated and any suggestive abnormalities should be checked by examining the patient in the recumbent and left lateral reclining positions. These positions frequently bring out murmurs not detectable in an upright position. This was more firmly impressed upon me by the following case: A male, aged 45, was seen because of enlarged liver and spleen and ascites. It was thought that he had a blood dyscrasia or liver disease, since auscultatory cardiac findings and blood pressure were normal and cardiac rate in the seventies and regular. However, when the patient was examined in the left lateral

reclining position, a diastolic mitral murmur was very easily heard, and a diagnosis of mitral valvulitis was certain. The congestive signs disappeared under treatment, and there is no doubt that this man could have passed the average insurance examination.

The most common source of error in auscultating the heart is in differentiation of a functional murmur. Diagnosis is aided by remembering that the functional murmur is (1) always systolic in time, (2) mitral or pulmonic, (3) not well transmitted, (4) accompanied by no other evidence of cardiac disease, (5) no enlargement, (6) no history of rheumatic fever, etc., (7) affected by exercise and posture.

Probably the three most important points are that the murmur which is functional in most cases is (1) Mitral systolic in time, (2) not well transmitted, and (3) accompanied by no cardiac enlargement.

Another common source of error is the labeling of a split mitral systole, which is normal phenomenon, as a mitral murmur. The split sound is due to slight asynchronization in contraction of the right and left ventricles which splits the first sound LUB into two parts, BID-LUB. This error has even resulted in turning down men when examined by the Army.

Organic heart murmurs are usually easily heard, especially if the patient is examined in various positions and where slight exercise is used to increase the intensity of heart sounds. Most organic murmurs are well transmitted. An exception is in mitral stenosis in which the murmur is frequently localized. Differentiation here, however, is not difficult because the sounds are usually classically typical of a banging mitral valve, and symptoms will usually be present to confirm the diagnosis.

The early aortic diastolic murmur is probably the most difficult of all to recognize. Keeping the possibility of such a murmur in mind during every examination and giving close attention to the aortic valve sounds will be the deciding factors in discovering this murmur. Having the patient lean forward and hold the expired breath phase will bring the heart closer to the anterior chest wall and, therefore, make the valve sounds louder or more audible. A history of rheumatic fever or history or evidence of lues will usually be found.

Another common error, which, however, is much less common in the past 10 years, is the labeling of every phase with an aortic systolic murmur as aortic stenosis. There are a great many patients with aortic systolic murmur, but only a small percentage have aortic stenosis. Aortic systolic murmur occurs rather frequently in hypertensive vascular disease and aortic atherosclerosis without hypertension. The usual explanation is increased dynamics in the blood ejected and sclerotic changes in the intima of the proximal aorta. True aortic stenosis, usually a sequel of rheumatic fever, is marked by a definite aortic systolic murmur, usually harsh and followed by an absent or markedly diminished second aortic sound. The plateau type pulse and slow forceful left ventricular contraction are further diagnostic aids.

Pulmonic systolic murmurs with a normal second sound and no cardiac enlargement are usually functional. They are found fairly frequently in children and sometimes are best heard in the recumbent position. They also are noted fairly commonly during the latter months of pregnancy when cardiorespiratory functions are somewhat altered by the increasing infradiaphragmatic pressure.

It is most important to auscultate the pulmonary valve area in infants and children since this is the site of murmurs in most congenital cardiac lesions. Since the advent of surgical cure of many previously doomed patients with congenital heart disease, it is extremely important that a specific diagnosis be made. Once the "machinery murmur" of a patent ductus arteriosus, so-called because it resembles the reverberating hum of machinery in a large factory, is heard, it will be recognized thereafter as practically pathognomonic of that lesion. Radiologic evaluation of the heart is indicated whenever an organic murmur is suspected or found and is especially helpful when congenital lesions are suspected.

The other important use of cardiac auscultation is for the study of heart rhythm. Regular rates between 60 and 100 are now recognized as within normal by the criteria committee of the American Heart Association. Nevertheless, for all practical purposes, we tend to classify those patients with rates in the sixties as predominantly vagotonic, and those who habitually have rates in the nineties as sympathicotonic. This classification has more significance when the approach to therapy is from an osteopathic viewpoint.

Fortunately, the more common disturbances of rhythm are recognized clinically. Some of them are:

1. *Sinus Tachycardia.*—This is a rapid regular rate, usually between 100 and 130, and commonly occurs because of excitement, exercise, or a disease as thyrotoxicosis, febrile states, or neurocirculatory asthenia. Some patients have cardiac rates of about 120 most of their lives with no detectable disease. Usually in these cases other evidence of a fixed sympathicotonia is present. I have seen several patients in whom the sinus tachycardia was present during examination by the referring doctor, but not during examination by me. The heart is ever a sensitive indicator of human emotions.

2. *Sinus Bradycardia.*—Rates below 60 are usually present because of vagotonic predominance. Especially is this so when no symptoms of heart disease are present. Rates in athletes may be as low as 40, as in the case of several long distance runners. Exercise usually increases the rate to a so-called normal level. If the functional nature of the slow heart rate is doubted, electrocardiographic study is indicated.

3. *Sinus Arrhythmia.*—This is found especially in children and more frequently during the convalescent stage of febrile diseases. It is easily diagnosed clinically by the increased rate during inspiration and the decreased rate during expiration.

4. *Auricular Fibrillation.*—This condition is diagnosable clinically in more than 90 per cent of patients by the absolute irregularity of the heart and the pulse deficit. Slower rates may be confusing and need electrocardiographic confirmation. The more common occurrence of this disorder in rheumatic endocarditis, especially mitral stenosis, and also in thyrotoxicosis and sclerotic heart disease aids in its recognition.

5. *Extrasystolic Arrhythmia.*—This disorder is usually easily recognized clinically by the coupling and compensatory pause noted at the apex and the sensation of dropped beat at the radial pulse.

Other unusual arrhythmias have clinical findings which are suggestive, but usually electrocardiographic study is necessary for their diagnosis.

PERCUSSION OF THE HEART

Cardiac enlargement is a very valuable index of cardiac disease. Besides being a positive indication of

heart disease, it also serves well to suggest the degree of cardiac involvement. Whenever cardiac enlargement is suspected or found, a 2 meter roentgen study should be made for confirmation and as a record for future comparison. The present tendency to ignore percussion of the heart because of fluoroscopy and x-ray films is regrettable. Percussion, when practiced correctly, gives fairly accurate information and, of course, saves time and is always available. In the average chest wall thickness, palpatory percussion is very effective and should be practiced more commonly.

Percussion of the liver for size should be routine. Normally, the lower border is at the right costal arch. However, not all borders which are lower than this are indicative of an enlarged liver. The upper border must still be in position and the liver edge be tender to palpation for congestive changes to be deduced. In patients with ptosis the liver border is frequently several fingers below the right costal arch, but the upper liver border will be proportionately lower and the liver edge will not be tender. This circumstance has frequently been confusing.

Ascites should be excluded by percussion with the patient first lying on one side and then the other for detection of signs of fluid shift.

When obvious right heart failure is present, percussion of the lung bases may reveal dullness due to an underlying hydrothorax. The lung bases should always be auscultated for crepitant and subcrepitant rales which are usually indicative of left ventricular failure and are the pulmonary equivalent of pretibial edema, ascites, and liver enlargement.

Examination of the lower extremities for obvious or early subcutaneous edema is important and may elicit the first objective indication of cardiac insufficiency. Statements by the patient that the ankles swell should be regarded with suspicion until actual edema is observed. The swelling complained of about the external malleoli usually proves to be a bursal fluid collection of rheumatic or old traumatic origin.

In closing this discussion, which has necessarily been brief and incomplete, it is timely to emphasize the need for proper interpretation of findings. An example which illustrates this need is that of a patient with mitral stenosis who coincidentally had chronic bilateral phlebitis with edema in the lower extremities and was treated for months by bed rest because the edema was assumed to be due to right heart failure. Actually cardiac compensation was good and bed rest was entirely unnecessary. Also, proper interpretation of laboratory findings is very necessary for an accurate diagnosis.

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The Importance of Diagnosis in Cardiovascular Diseases From the Pathologist's Point of View

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No writer in modern times has had an easier subject to sell to an audience than the title assigned to me for today. The importance of diagnosis in the healing arts has been so stressed as to become almost an obsession, a fetish, among physicians. Long before I entered the osteopathic school, I had heard much about the importance of diagnosis and the stumbling blocks that lie in the path of the physician in trying to establish a diagnosis—these things I learned not from a physician, but from a layman—so well known was the problem of diagnosis 25 years ago.

Perhaps so much stress upon the difficulties of diagnosis created complexes or conflicts in the minds of us young people preparing to enter the healing professions. Then again, perhaps this served to stimulate us to greater efforts that we might attain excellence in the healing art. It is well to remember that the public, as well as we of the profession, are aware of the importance of diagnosis in the healing art.

It is a primitive principle that the physician must first establish a diagnosis before being able to treat a disease condition satisfactorily. The word "satisfactorily" as here used might be variously interpreted. It might mean satisfactorily so far as the patient's recovery is concerned, or it might mean satisfactorily so far as the physician's purse is concerned, or it might mean satisfactorily so far as the physician's investigative mind is concerned.

The patient's chief concern is to recover—if he can be told that he is one in a million who has recovered from some loathsome disease (the more serious the better) he is thoroughly flattered and pleased that he should have been so fortunate as to be chosen from among his fellow men to be so singularly honored. Many spectacular recoveries from uniformly fatal diseases can be laid to errors in diagnosis. Even in this regard, one should not be too hasty in arriving at conclusions, for, as an example, well authenticated examples of spontaneous disappearance of malignant tumors have been reported.

To the physician who is deeply interested in his art and science, it is a great calamity to make errors in diagnosis, and ascribe therapeutic worth to procedures which prove to have been directed against the wrong disease.

Just as in many other phases of our existence there are grades of excellence and completeness, so there are grades of completeness and excellence in diagnosis. To one physician it may be sufficient to establish a condition as heart disease — to another, valvular heart disease is better, to another, chronic rheumatic heart disease with involvement of the mitral curtain is better still. The neurologists have set quite an example for precision and topographical circumscription of diagnosis.

Even the courts of law recognize the difficulties of diagnosis. It is customary not to hold the general practitioner too closely accountable for his diagnosis, as long as his therapy is in keeping with his diagnosis. This rule, of course, does not apply to one who holds himself out as a specialist—he is supposed to diagnose correctly. Unfortunately, physicians for ages have been guilty of hiding behind a screen of what they call "judgment." The physician says, "In my judg-

ment the condition was so and so." The law is now coming to turn this term against us for judgment means, "a nicety of differentiation, by careful and mature deliberation, between similar things." The old statement, "In my judgment" does not indicate a nicety of differentiation, nor does it indicate any careful and mature deliberation.

With the development of materials and methods and apparatus of precision, there is no longer as great excuse for errors in diagnosis. The unfortunate thing is that physicians do not fully utilize the methods at their command for diagnosis. Sometimes the most obvious items are overlooked in diagnosis. Repeatedly one notes the uterus invaded by curettage without such elementary information as the date of the last menstrual period. Such errors of omission are frequent in all divisions of the healing art.

Hindsight is ofttimes clearer than foresight, and at the autopsy table when internal structures are revealed to direct inspection, hidden indications for investigation become apparent. There is nothing smart in the pathologist's reviling his medical colleagues for such omissions; it is better that each of us profit by these experiences. A greater attention to detail on the part of each physician will go a long way to improving diagnosis generally.

By and large the doctor with one clue or bit of evidence pointing to a given disease is subject to greater error than the physician who accumulates by physical and laboratory means a host of clues pointing in one direction. All the laboratory data at the command of the physician will serve no useful purpose, however, unless it is weighed and evaluated in the light of the patient's clinical condition. Tragic mistakes sometimes are made when the physician hastily thumbs over the accumulated data, without weighing the significance of each finding.

There is an angle to the importance of diagnosis in cardiovascular disease, or any other field of the healing art, which is sometimes tragically overlooked. Each of us has on one or more occasions seen cardiovascular invalids as a burden to society throughout their lives, when they might have been useful citizens if the doctor had been a bit more discreet in his pronouncement of diagnosis. Indeed, many of these patients may not have had any serious cardiovascular disease to begin with. True, many of these people are psychopaths anyway, but the doctor may have been guilty of providing the opportunity for this unfortunate expression of their mental illness. An instance comes to mind of a young man much pampered by his family, unable to go to school, unable to engage in gainful occupation, a burden to his family and society, because the doctor once said he had "rheumatism of the heart." Yet the same young man seems to be able to engage in all sorts of dissipation and debauchery.

Some few years ago, in a lecture under the auspices of the Coroner's Department of Philadelphia, Edward Krumbhaar used the expression, "the constellation of diseases"—an apt expression for the well-known fact that human bodies are frequently involved by more than one disease. Sometimes this, sometimes that disease shines out more brightly in the constellation. Not infrequently the patient with manifestation of pain if seen by the internist is diagnosed as having a coronary occlusive disease; if seen by the surgeon a diagnosis of cholelithiasis may be offered; when and if seen by the pathologist at autopsy, probably a diagnosis of coronary occlusive disease and cholelithiasis, among other findings. Perhaps this reverts to a previous paragraph concerning completeness of diagnosis, but the point is that patients may, and usually do, harbor more than one disease, indeed sometimes diseases of the same magnitude in the constellation. The surgeon who overlooks cardiovascular disease when dealing with abdominal distress may be responsible for needless deaths. By way of further reference to the constellation of diseases, there has been a tendency in many quarters to investigate no further if serology is found to be positive for syphilis; the patient may or may not have syphilis, but he may also have other diseases as well, the overlooking of which may prove fatal.

Some time ago it was my privilege to examine a patient picked up by the police for drunkenness—the man, a respected and distinguished citizen, had been found along the highway. His disease, however, was cardiovascular — cerebral thrombosis. In fact I have every reason to believe he had not been drinking, much less drunken. In this instance correct diagnosis of cardiovascular pathology was a matter of great medicolegal importance. During the recent war effort, when there was great activity in the collection of human blood for banks and for the making of plasma, a similar phenomenon was observed. I had occasion to question some people at one of the collecting stations, and I found that they no longer dispensed alcoholic beverages after blood donations, because on occasion some very highly respected citizens had been apprehended by the police on the highway when they were stricken by cardiovascular phenomena. The police, smelling alcohol on their breaths, assumed them to have been drunk. Simple sniffing of the breath does not indicate that nicety of differentiation spoken of as judgment in differential diagnosis.

Correct diagnosis in cardiovascular disease is quite imperative if we are to cut down the toll of highway deaths. It would seem unwise to allow individuals with known major cardiovascular pathology to drive their own high-powered vehicle, not only from the standpoint of their own lives and safety, but also from the standpoint of the safety of the community. Our railroads have recognized this danger for some time. Perhaps it is time to consider some sort of emergency safety devices for motor transportation to take into account this contingency.

The following is a problem frequently encountered by the physician, perhaps the pathologist. An individual is found dead at the foot of a flight of steps. This individual has carried life insurance in the amount of $50,000 with double indemnity clauses for accidental death. If he stumbled at the top of the stairs, fell and died of a fractured skull, his beneficiary might well claim $100,000 insurance payment. If the deceased was a victim of some form of acute myocardial insufficiency as coronary occlusive disease, or perhaps suffered a major cerebral vascular accident, and died at the top of the steps, and rolled down, the claim might rightfully be $50,000. In any event the differential diagnosis makes a difference of $50,000 to each party concerned.

Ofttimes we hear complaints by those who are engaged to make routine physical examinations for insurance companies or for employment or military purposes, the complaint that these routine procedures

are boring, inconsequential, etc. The facts are that these fields offer a great opportunity to do service. They are important fields and should be interesting and enticing to qualified people. Here is a field of major importance in cardiovascular diagnosis.

Diagnosis remains the shining star by which therapeutics sets its course. Diagnosis can be and sometimes is difficult and elusive, yet few human endeavors prove quite so intriguing and stimulating. Success in this field, like in most others, seems to hinge upon attention to detail, or perhaps a better expression might be undivided attention.

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Symptom Diagnosis in Cardiovascular Disease

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A symptom or set of symptoms is the compelling influence which causes the patient who thinks he has heart disease to seek a physician. There are probably as many patients without heart disease who present the symptoms of it as there are those who have both symptoms and the pathology. The complex ramifications of human hysteria, apprehension, and introspection, nevertheless, must be considered by the physician even more than the differentiation of the diverse cardiopathies. Should he be too anxious to emphasize the morbidity without consideration of the patient's mental reactions, he may inaugurate a symptom-complex which can become more serious than the heart disease itself.

Practically all heart disease is secondary to pathology elsewhere and its subjective manifestations are often diversified and intermixed with those of the primary disease. Furthermore, when the heart is diseased, its physiology is altered, and this change in function may be reflected in any of the organs and tissues of the body to which it normally supplies nourishment and oxygen. As a result, it is not unusual to find the patient's chief complaint directed to some part of the body remote from the anatomical location of the heart itself. Contrariwise, disorder in other parts of the body may be reflected by altered physiology of a perfectly normal heart.

In the analysis of the symptom diagnosis of circulatory disease, the physician must be equally aware of the remote symptoms of heart disease and of the symptoms which arise from altered function of the heart, secondary to distant pathology. It is apparent that he should never jump to conclusions on the single basis of symptom diagnosis. One injudicious statement on his part can materially alter the pattern of the future life of a sensitive subject. There is probably no part of the complex human thought processes that is so subject to misinterpretations as that which concerns the heart. The literate patient gives heed to the many sudden deaths resulting from cardiopathies; even children worry about complications of rheumatism because they see the prominent advertisements of insurance companies presenting this disease in its worst light. Every one in middle life has lost friends or relatives from undiagnosed heart disease. Because of all of these facets of modern education, there is an increasing apprehension about circulatory disorders. In spite of all the warnings, in spite of greater and greater emphasis upon periodic health examinations, and even though we have an "enlightened public," there are just as many people dying of heart disease as ever before. Fear probably has something to do with this situation. Undoubtedly fear has much to do with some of the symptoms observed in the patient with heart disease. Unfortunately, too many physicians are too greatly impressed by the lay literature and too little conscious of the patient as a living, thinking individual, rather than a piece of pathology.

In the analysis of the heart symptoms, it is well to consider the patient as a whole, not forgetting some attention to his emotional and psychological reactions. Human beings have died cardiac deaths for which the pathological cause could not be demonstrated at autopsy, while many patients with cardiac disease live on and on, even though all tests and clinical criteria suggest that they should have died long before. Some people suffer from breathlessness for years and ultimately die of some circumstance unrelated to cardiac disease; others have valvular defects, "leaking hearts," from childhood and live into the eighth and ninth decades. So, in evaluating the symptoms and diagnosis of heart disease, the physician should be as conscious of the innocuous side as he is of the serious implications.

The pathological physiology of each cardiopathy usually explains its symptomatology and it often provides the basis for prognosis as well as treatment. For instance, the patient who has some strain on his left ventricle will usually show some evidences of faulty circulation to the brain, among them insomnia, frequent dreaming, irritability, and, occasionally, hallucinations. These, then, are symptomatic of the cardiovascular diseases which produce strain upon this ventricle, such as aortic valvular defects, aortic atheroma, aortitis, aneurysm, and hypertensive aorta. These same pathologies produce the more severe symptoms of left ventricular failure because it is this part of the heart which suffers the secondary effects of aortic morbidity.

Because of the close physiopathologic relation between aorta and left ventricle, sudden and dramatic, even fatal, unexpected episodes may occur, before or soon after left congestive failure is recognized. The earliest symptoms of left congestive heart failure are, therefore, of the greatest significance in the patient who may have some disease at or near the aorta. Nocturnal dyspnea and wheezing, a sensation of oppression behind the sternum, or both, occurring at night are the earliest symptoms of left ventricular failure. One or several of these symptoms will always precede acute failure by several months. The recognition of their importance by the physician is often lifesaving, for, oddly enough, many patients forget these subjective manifestations until questioned specifically about them. Not a few of them will report that they are sleeping on extra pillows because they have found that they breathe better that way. It is the unusual patient who recognizes this habit as a cardiological symptom.

Right congestive heart failure is not characterized by the dramatic and fatal episodes which are so star-

tling in left heart failure. The usual cause of right heart failure is mitral valvular disease in which the left auricle dilates but the great capillary bed in the lungs makes up for the incompetency in the circulation through the heart. To be sure, these patients are subject to intractable coughs and some of them spit up blood; they become breathless upon exertion, and they often have cyanosis of the buccal membranes because of the altered pulmonary circulation. But they do not die suddenly! The distinctive heart symptoms appear before there has been any great degree of failure; the patient seeks advice and willingly follows it. He may suffer from a number of these bouts and recover promptly from each of them. When the right ventricle finally fails, and it is usually quite a few years before it does, the patient develops digestive symptoms especially referable to the liver. In fact, in cases of long standing, cirrhosis of the liver is a common complication. Some of these patients have a preponderance of digestive rather than cardiac symptoms and are too frequently and too long treated for "sluggish liver," "biliousness," gallbladder disorders, and the like. The outstanding symptoms of the failing heart of middle life are often found in the digestive tract. Ankle edema ensues and, finally, the defective portal circulation brings about hemorrhoids and, ultimately, abdominal ascites and anasarca.

The symptomatic development, however, takes place much more slowly in right heart failure than in that involving the left ventricle because of the large bed of blood vessels accommodating for it in the lungs. The right auricle enlarges to make up for the defective valve, before the right ventricle becomes greatly involved. The right ventricle is the key to the situation. This long physiopathologic sequence results in symptoms of severe enough grade to be noticed long before the patient is in danger. The physician has time to educate his patient and to apply proper treatment.

The analysis of the symptom, pain in the chest, is the most frequent one required in cardiology. Patients fear chest pain and they need very slight degrees of it to bring them into the physician's office. They very properly associate this symptom with sudden death. And yet, there are as many instances of chest pain without serious cardiopathy as there are those with it. It is not enough to know that there is, or is not, precordial pain—its characteristics must be determined. Its grade may vary from a sense of oppression behind the sternum to the excruciating stabs which carry the sufferer into the shock of sudden coronary occlusion.

The chest pain of serious import is that which is found in the upper parts of the precordium, especially if it is referred into the left arm and more especially if it is transmitted as far as the wrist. It is unusual indeed to have pain of this nature without definite cardiopathy. Pain behind the upper sternum and referred to the right arm or into the root of the neck is of almost equal significance and it, too, must be considered of cardiac origin until proved otherwise. Low precordial pain is of less importance in cardiology because it can arise from disease of the upper digestive tract, from the biliary passages or pancreas. It may be caused by achalasia of the cardia or esophageal spasm. Osteopathic joint lesions of the thoracic column and the rib attachments may be responsible, but the most common cause of low precordial pain is overactivity of the heart in the form of one of the simple tachycardias or associated with auricular fibrillation or flutter. In nearly all of these circumstances there is palpatory tenderness between the ribs and extending backwards toward the vertebral column.

The mechanism of chest pain has never been completely understood in all instances, but it is probably due, for the most part, to changed circulation in the myocardium. A deficient blood stream may be causative, tachycardia may affect it mechanically, or there may be some local pathology bringing it about. If it is the last of these, the disease should be found in the coronary blood vessels or in the aorta near the origins of these arteries. The patient who has angina pectoris, then, must be studied first from the viewpoint of these serious pathologies. It is immediately apparent that a defect in the mitral valve can have little to do with the production of chest pain, but it is not unusual to find a mitral murmur in patients with chest pain due to a far more dangerous disease in some other part of the circulatory system. On the other hand, the pain from auricular overactivity is often due to mitral disease which has been the forerunner of the pathology in the pacemaker. The analysis of the symptom, pain in the chest, becomes an important segment in diagnosis, treatment, and prognosis.

Vertigo and syncope are the outstanding symptoms of heart block, but they might be found in the patient who is subject to sudden changes in cardiac rhythm from any cause. Until heart block can be ruled out by electrocardiography, head symptoms should be regarded as serious. Both vertigo and syncope can be symptomatic of numerous extracardial conditions and they are quite common in both increased and decreased arterial tension. Likewise, headache is a symptom of blood pressure changes, especially hypertension, but one can scarcely emphasize the cardiac phases of headache when there are so many other conditions in which it is so much more common.

It requires direct questioning to find the relatively large number of patients with hypertension and arteriosclerosis who have some defect in their vision. Almost no one tries the sight in one or the other of his eyes, singly, except during examination of his eyesight. Yet there are quite a few people who find that there is some blurring of the vision when they close one eye and test its fellow. Blurred vision, especially when it is unilateral, can be an important subjective criterion of the state of the retinal vessels; it is not an infallible symptom but it is certainly a suggestive one. The state of the retinal vessels may well reflect the status of the more important arteries behind them in the brain.

The serious heart conditions are those in which there is evidence of failure, and it is usually the failing heart which gives rise to symptoms. In his evaluation of the symptomatology of heart disease, the physician must keep some classification of heart failure in mind to explain the differing prognosis in the different types. Right congestive heart failure is characterized by clinical symptoms which can be covered by an alliteration of the letter "c," viz., cough, cyanosis, and congestion. This last covers the lungs, pleura, and the digestive and the other systems which become congested and develop symptoms. Patients with right heart failure seldom die suddenly or without warning; both the patient and his physician have ample time to prolong life. Not so with left congestive heart failure

in which sudden death and serious cardiac episodes can be expected. In this type of heart failure, the clinical symptoms may be suggested by an alliteration of the letter "p," viz., pain, pallor, pulse changes such as the plateau pulse of aortic stenosis or the water hammer pulse of aortic insufficiency; pressure changes such as discrepancy in the arterial tension of the two arms in aortic atheroma, aortitis, and aneurysm; the low and high pulse pressures of aortic stenosis and insufficiency, respectively, and peripheral circulatory changes which account for the cerebral symptoms. Many patients, all of them in the final stages of failure, present symptoms of both right and left congestive failure.

Anginal failure completes the clinical picture. This is the type which is seen in acute coronary artery disease, especially with sudden occlusion. Its name describes its outstanding characteristic, chest pain. The other signs are much the same as those described for left congestive heart failure. When shock, with its constitutional symptoms of decreasing blood pressure and increasing pulse rate; cold, clammy extremities; and fear of impending death, complicates the picture of failure, one may be quite sure that there has been a sudden coronary occlusion. At least, when this combination of symptoms is present, a provisional diagnosis of acute coronary disease with sudden occlusion should be insisted upon until the indicated objective and laboratory surveys have been concluded and the electrocardiogram made.

The original examination of the patient with heart disease begins with symptomatology. The physician examining such patients for the first time has a great responsibility, not only in the differentiation of the pathology, but also in the direction of the patient's thinking and activities. In one case he might be very reassuring; in another he must be guarded in his opinion, and a third might require that he immediately become very serious about his diagnosis. In any event the doctor needs to be cautious until all necessary data have been accumulated.

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Electrocardiographic Diagnosis

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The electrocardiograph as an instrument of precision in cardiac diagnosis has been developed greatly in the past 20 years. From 1901 when the principle was first utilized successfully by Einthoven until the late 1920's, diagnosis by electrocardiography progressed very slowly. Comparatively few physicians became expert in reading the electrocardiogram, and its use was limited mostly to differentiating the cardiac arrhythmias. However, as more data accumulated and a greater number of physicians became expert in this diagnostic procedure, it was discovered to be invaluable in other cardiac disorders. These will be named and discussed later as the main indications for the use of the electrocardiogram in cardiac diagnosis. First, however, it is timely here and now to discuss some of the abuses of the electrocardiogram as a diagnostic aid.

These abuses have been committed mostly as a result of the belief by the laity that an electrocardiogram is the final word in the diagnosis of heart disease. This belief has frequently been further confirmed by the general practitioner's failure to correct it. Also, the newspaper and magazine publicity given electrocardiography from time to time has usually dramatized the diagnostic virtue of the instrument, and, of course, never stressed the numerous cardiac diseases where it is useless or has little value.

Another very serious abuse of electrocardiography is one which has also occurred in the field of roentgenology. The abuse to which I refer is the purchase and indiscriminate use of the electrocardiograph by physicians who are untrained in the science of electrocardiography and have not had special training in cardiology. Too many times such individuals order unnecessary electrocardiograms and, even worse, make wrong interpretations, creating cardiac neuroses. Further, they attempt interpretations from the electrocardiogram which are impossible, improbable, and even ridiculous. I have even seen some leads in the graph mounted upside down with an interpretation given on the upside-down lead. Many graphs which are perfectly normal have been labeled by the would-be, self-styled specialist as indicative of one or another organic heart disease. Some have even deduced from the graph the degree of thickness of the sclerotic coronary arteries or the measurements of a myocardial infarction. Most errors seem to occur in labeling normal graphs as abnormal. This, of course, is followed by unnecessary treatment and frequently the creation of imaginary cardiac invalidism. The normal electrocardiogram has so many potential variations that one must be expert in interpretation before making a diagnosis of abnormality.

A case history will illustrate this danger. A male, aged 34, while riding in an automobile was seized with precordial pain. He was taken by a friend to the private hospital of a surgeon. An electrocardiogram was made by the surgeon and interpreted by him. He told the patient that the graph showed coronary disease and that his chest pain had been an anginal attack. Physical activity was restricted and aminophylline was given. The patient became very depressed mentally and was a confirmed cardiac cripple. Whereas previously he had played tennis, he now gave up all athletic activity and even walked slowly. He was finally seen in a cardiac clinic where, upon taking his case history, it was suspected that a false diagnosis had been made. An electrocardiogram including all precordial leads was perfectly normal as was his general physical condition. He was told that he did not have heart disease and that his precordial pain was functional. Although all restrictions on activtiy were lifted and he was told to play tennis, it was some time before he was willing to accept the new diagnosis and dismiss his fears and anxieties. Errors, of course, have also been made by not recognizing important abnormalities in the electrocardiogram, resulting in wrong clinical diagnosis, prognosis, and treatment.

At the outset, it must be remembered that from a practical viewpoint there is a limited amount of information available from an electrocardiographic tracing. It measures precisely and to the fraction of a second various intervals in the passage of the nerve impulse through the bundle of His, from its origin in the

sinoauricular node to its termination in the Purkinje fibers in the myocardium. Deviations from normal conduction time may be accurately measured, these being mostly in the form of delayed conduction of the impulse because of disease in the myocardium and the bundle of His. This delay may and does occur at varying sections of the nerve pathway. Also, if the function of pacemaker, normally assumed by the sinoauricular node, is usurped and taken over by another focus of neuromuscular tissue in the myocardium, or the bundle of His, this will be graphically seen in the electrocardiogram. Therefore, for diagnosis of disturbances of rhythm the electrocardiogram is a specific medium because it records anatomic physiology and physiopathology in the bundle of His.

Secondly, because of the physical principle of positive and negative polarity, myocardial tissue which is markedly damaged by disease, even to the point of fibrous tissue replacement as seen in healed myocardial infarctions, may be recognized as such when the T waves are recorded. Ischemic and cicatrized tissue shows in the graph by inversion of the T waves. Further than this, the ischemic or infarcted area of myocardium may frequently be exactly located by use of multiple precordial leads.

These two fundamental factors—the ability to record an impulse traversing a nerve pathway and the fact that ischemic myocardium records on the graph by inversion of the T waves—make it possible to understand more than 75 per cent of electrocardiographic diagnoses.

The electrocardiogram should always be interpreted along with the clinical findings. It adds supplementary data to the history, physical examination and x-ray and laboratory findings. The graph should be interpreted by the clinician who examines the patient. A complete diagnosis including etiology, anatomic and physiologic changes, functional capacity, etc., can never be made from an electrocardiogram alone. It cannot be stressed too repeatedly that the electrocardiogram is a diagnostic aid giving a specialized type of information, many times of invaluable help and many times of no help in completing a diagnosis. There is much misinformation regarding the information which may be deduced from a tracing. The following statements will serve to correct some of these erroneous impressions.

1. The electrocardiogram may be normal in the presence of serious disease. Examples are:

a. Subacute bacterial endocarditis—the diagnosis is made by the presence of a murmur and a positive blood culture. The graph may be and often is entirely normal.

b. Congestive heart failure—the graph may be normal, especially when the failure is due to rheumatic heart disease and no arrhythmia is present.

c. Angina pectoris—a small percentage of these patients do have normal tracings and yet have typical anginal pains of coronary origin.

d. Coronary artery disease with myocardial infarction where the graph later returns to normal.

e. Rheumatic valvular lesions of serious import. An electrocardiogram does not indicate the presence of valvular disease and very often is quite normal in rheumatic valvular disease. However, when the electrocardiogram is abnormal, heart disease is practically always present. The cardiac disease may be asymptomatic and even not be recognizable on physical examination. An example of this is the finding of a prolonged P-R interval in the graph of a child sick in bed with acute rheumatic fever. The rheumatic fever at this stage may have involved the myocardium and the bundle of His, but not yet resulted in endocarditis and valvular deformity. Therefore, no murmur would be present, and the only positive evidence of cardiac involvement would be that seen in the electrocardiogram. This finding has on many occasions been the differentiating one when it was not certain whether the child had acute appendicitis or the acute abdominal manifestations of rheumatic fever which so closely simulate acute appendicitis. The decision not to operate has many times been made on this finding of a prolonged conduction time in the auricular portion of the nerve pathway.

2. An electrocardiogram does not indicate the state of cardiac compensation or reserve. As stated previously, the graph may be normal in the presence of congestive failure. Even when abnormal findings are present in the graph, they are not to be interpreted in terms of degree of cardiac compensation or decompensation. A patient who had a minimal myocardial infarction a year ago may now show an abnormal electrocardiogram with inverted T waves as evidence of the healed infarction. However, he may be entirely asymptomatic with good exercise tolerance. On the contrary, another patient may have a similar electrocardiogram and be suffering with angina of effort and poor exercise tolerance. Symptoms and degree of cardiac efficiency or insufficiency should never be deduced from an electrocardiographic tracing. It is even possible that a patient who has had an acute coronary occlusion with the graph later returning to a normal pattern, may now be dying with congestive heart failure and yet show a normal graph. Granted that this is not the usual course of events, it does serve to remind us of the limitations in interpretation of electrocardiograms.

3. The electrocardiogram does not indicate the prognosis. A prognosis should never be given by an electrocardiographer who sees the tracing alone and does not examine the patient. The prognosis should be based on a complete diagnosis made with all available data including history, physical examination, x-ray studies, laboratory, and electrocardiographic data. The graph is useful in prognosis only when used with all other clinical findings which add up to a complete inventory of the patient's cardiovascular status.

4. The electrocardiogram does not give an etiologic diagnosis. It may frequently be stated that the tracing is compatible with a certain cardiac disease. Certain findings as right axis deviation, P wave changes, and prolonged P-R interval are known to be common in mitral stenosis; but they may also be present in pulmonary valve lesions. A graph may be diagnostic of myocardial infarction but that infarction could have a varying etiology. It may be arteriosclerosis, syphilis, or, rarely, periarteritis nodosa. Of course, from a practical viewpoint, more than 90 per cent of cases would be due to coronary arteriosclerosis, but the tracing does not make this etiologic differentiation.

It has been said that no cardiac study is complete without an electrocardiogram. About 10 years ago this

would not have been as acceptable a statement as it is today. Many cardiologists refrained from doing a graph if physical findings were entirely negative and it was quite certain from the history and physical examination that no heart disease was present. This practice was due to the reluctance on the part of many physicians to order what was considered unnecessary diagnostic work. This was being honest with patients and frequently was good psychotherapy when the patient was told he had no cardiovascular abnormalities to warrent further study.

However, as accumulating data revealed that occasionally heart disease was only detected in the electrocardiogram in otherwise normal patients, and as its use became more developed in detecting cardiac changes in early stages, and as preventive medicine principles asserted themselves in the field of cardiology, the practice of routine electrocardiograms on all patients having a cardiac study became firmly established. Today, the average patient who is referred for cardiac study frequently will not be satisfied if an electrocardiogram is not part of the examination. This is especially true in those with cardiac neuroses who require reassurance that their hearts are normal as proved by all known tests of cardiac function. In this respect a negative electrocardiogram is a therapeutic weapon in the hands of the physician treating a cardiac neurosis. Because of the abnormal belief of the laity that the test is the last word in cardiac diagnosis, it has frequently, when reported as negative, been the main factor in curing a cardiac neurosis.

In one instance I saw a female patient in menopause who complained of frequent functional precordial pain, actually relieved of her pains after an electrocardiographic examination, which she thought was a form of cardiac treatment. When referred for an electrocardiogram, she was not told that it was a test. When the electrodes were applied, she assumed it was a treatment for her heart pains. She had faith in the "treatment" and her precordial pains disappeared. Unfortunately, the deception could not be continued for obvious reasons, and a potent therapeutic agency lost its value when the truth was known.

There are definite indications for the use of the electrocardiograph. Some diseases are only finally and positively diagnosed by an electrocardiogram. In many instances the diagnosis, made possible only because of the electrocardiogram, has been the indication for a life-saving drug which could only be safely given when the true diagnosis was known.

Following are named four indications for electrocardiographic diagnosis given in the order of their importance: (1) Arrhythmias, (2) coronary disease (sclerosis, acute occlusion), (3) myocardial disease, and (4) to follow effects of cardiac drugs.

There are numerous other diseases where the electrocardiogram is valuable, but the above mentioned groups include more than 90 per cent of the possible indications. Other diseases met much less commonly but showing electrocardiographic changes are acute cor pulmonale, acute pericarditis, pericardial effusion, congenital cardiac lesions, periarteritis nodosa, myxedema, and others.

ARRHYTHMIAS

As previously discussed, these disorders lend themselves most specifically to accurate diagnosis by the electrocardiogram. While there are clinical criteria for the recognition of many arrhythmias, there are others which are only diagnosed after electrocardiographic study. At times the speedy treatment of arrhythmia in a desperately ill patient saves the patient's life. Many times a decision must be made whether to administer digitalis or quinidine. The decision is important because of the important contraindications for each drug.

Auricular fibrillation can usually be diagnosed clinically without an electrocardiogram. It is, however, desirable to have one for confirmation and also for future comparison to note response to therapy. Auricular fibrillation of slow rate may frequently only be diagnosed by electrocardiogram. There are many arrhythmias that are only diagnosed by electrocardiography. The more common of these are: (1) Ventricular tachycardia, (2) ventricular fibrillation, (3) auricular flutter, (4) auriculoventricular block, (5) bundle branch block, (6) slow auricular fibrillation, (7) nodal rhythm, (8) nodal tachycardia, (9) paroxysmal tachycardias, (10) sinus arrest, and (11) wandering pacemaker.

The paroxysmal arrhythmias and especially paroxysmal tachycardia may be of several types and may require different treatment. Therefore, it is desirable to know, when possible, the exact mechanism. Paroxysmal auricular tachycardia, which is usually quite benign when present in a patient with a healthy heart, responds well to mechanical pressure of the carotid sinus or the eyeball. On the contrary, paroxysmal ventricular tachycardia, which usually occurs in the presence of serious heart disease, does not respond to this treatment but is very amenable to the use of quinidine sulfate. Also, if ventricular tachycardia is diagnosed, digitalis is usually contraindicated.

If the electrocardiogram should reveal that the A-V node has assumed the role of pacemaker and nodal tachycardia is present, then digitalis will be the drug of choice and should be very effective.

This is only to mention three types of arrhythmia, but it is apparent how useful an electrocardiogram can be in treating the arrhythmias.

Auricular flutter is diagnosed by electrocardiogram, and it is important that the right diagnosis be made since rates are usually very rapid. When digitalis is given, the flutter is changed to auricular fibrillation and then to normal sinus rhythm.

Extrasystoles are usually recognizable by clinical means alone, but when they occur frequently they may be arising from several different locations in the heart. When they do arise from more than one focus, they are more apt to be due to myocardial disease. An electrocardiogram reveals the source of extrasystoles even to the muscle of an individual chamber.

Bundle branch block is diagnosed only by electrocardiogram. When the ventricular complexes are .12 second or wider and the T waves point in an opposite direction to the ventricular complex, this lesion is diagnosed. Both right and left bundle branch block are differentiated and a third type—arborization block—is recognized. Clinically, splitting of the first heart sound is suggestive of bundle branch block, especially when a known cardiac disease is present. The presence of bundle branch block makes the prognosis more grave.

CORONARY ARTERY DISEASE

Here, as in the arrhythmias, electrocardiographic diagnosis is unexcelled. Before the possibilities in diagnosis of coronary disease had been developed, acute coronary occlusion was frequently misdiagnosed as "acute indigestion." The past 20 years have seen a remarkable development in the recognition of cor-

onary disease, both acute and chronic. It is now recognized as good policy for all males past 45 years of age to have routinely an electrocardiogram as part of the health check-up. This is done mostly to detect coronary disease before symptoms appear and significant damage is done.

In diagnosing acute coronary thrombosis with myocardial infarction, the graph is documentary evidence and serves well to locate the area of infarction, detect disturbances of rhythm, and is a good medium for recording progress as healing of the infarct occurs. There is a proper time for the electrocardiogram in suspected acute coronary occlusion. The best time, unless arrhythmia is present, is about 12 to 24 hours, preferably the latter, after the pain first appears. When taken too soon, say in the first few hours of an attack, the electrocardiographic changes are often inconclusive. In suspecting coronary occlusion the electrocardiographic machine should be taken to the patient and never the reverse as so often happens. Unless an unusual arrhythmia is present, an electrocardiogram taken within the first 24 hours seldom influences treatment. The indications for therapy are rest and sedation until pain is relieved. When the electrocardiogram is taken it confirms the diagnosis, frequently indicates the area of infarction, and makes the diagnosis more final. Recheck graphs in these cases are dependent upon changes noted clinically in the status of the patient. If extrasystoles appear or any disturbance of rhythm is noted, a recheck graph is indicated. Conversely, if rhythm remains normal a recheck graph need not be made until the patient is ready to get out of bed or even until after he is ambulatory.

Occasionally the electrocardiogram is entirely normal in a patient who has presented a typical clinical picture of acute coronary thrombosis. In such a circumstance, the diagnosis is made on the clinical findings, which are considered prime evidence when classically typical.

Coronary arteriosclerosis is usually recognizable in the electrocardiogram mostly as T wave changes toward inversion and also as S-T segment elevations or depressions. However, there is, as mentioned previously, a small percentage of patients who have typical angina pectoris attacks but normal electrocardiograms. On the contrary, electrocardiographic evidence of coronary artery disease may be found in the absence of significant clinical evidence of coronary sclerosis.

It is most important that a diagnosis of coronary arteriosclerosis be made only after complete study of the patient. There are noncardiac causes of the inverted T waves which are usually identified with coronary artery disease. For instance, there is a hyperventilation syndrome with alkalosis, which not only results temporarily in inverted T waves but also causes chest pain simulating coronary pain. Then, too, there are the known effects of cardiac drugs in depressing the S-T segment and inverting T waves. The T waves may be inverted in cases of aortic insufficiency because or poor coronary filling due to low diastolic pressure. In the latter instance the coronary arteries may be quite normal but because of lowered aortic diastolic pressure are inadequately filled with blood, resulting in myocardial ischemia and, of course, inverted T waves.

DETECTION OF MYOCARDIAL DISEASE

An electrocardiogram gives valuable evidence in many cases regarding inflammatory or degenerative myocardial disease. When conduction times are abnormally long, it may be assumed that the myocardium contiguous to that section of the bundle of His is diseased. Thus, when the Q-R-S interval is beyond .12 second it is conclusive evidence of significant damage to the ventricular muscle. When the P-R interval is prolonged, one suspects auricular muscle damage. Also slurring, notching, or splintering of the waves, particularly the ventricular complexes, gives information pertaining to myocardial damage. To be of practical value these changes must only be interpreted in the light of the clinical findings.

EFFECTS OF DRUGS ON ELECTROCARDIOGRAM

Both digitalis and quinidine have an effect on the electrocardiographic tracing; they first depress the S-T segment and then invert the T wave. The effect is a distinctive one and may be noted as such, as once, when present. Digitalis especially tends to produce a toxic A-V block and thus prolongs the P-R interval. This effect should be watched for in the graph of patients receiving the drug. These drugs maintain their effect on the graph waves for 3 to 6 weeks after their discontinuance. This must be remembered for many patients have tracings made in the first few weeks following discontinuance of the drug. Other drugs such as xanthines, bromides, phenobarbital, and nitrates, when taken orally have little or no effect on the electrocardiogram.

SUMMARY

A brief resume and discussion of the value of electrocardiography have been given. Some arrhythmias have been discussed and the possibility of diagnosing coronary disease electrocardiographically has been briefly reviewed. Use of the electrocardiograph in detecting myocardial disease and also in following the effects of cardiac drugs has been mentioned.

1700 Walnut St.

KANSAS CITY CHILD HEALTH CONFERENCE TO BE HELD MAY 10 TO 12

The Sixteenth Annual Child Health Conference, sponsored jointly by the Kansas City College of Osteopathy and Surgery and the Jackson County Osteopathic Association, will be held in the Main Arena and Little Theatre of the Municipal Auditorium, Kansas City, Mo., May 10 to 12 inclusive. An invitation is extended to all osteopathic physicians interested in pediatrics to participate in this 3-day conference and clinic. According to the program chairman, Dr. L. Raymond Hall, well-known specialists in pediatrics are scheduled to present scientific papers. The complete program will be published in the April FORUM OF OSTEOPATHY.

Just 2 days previous to the Child Health Conference, the annual alumni homecoming celebration will take place at the Kansas City College of Osteopathy and Surgery.

The Diarrheas of Infancy and Childhood*

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In the past few years the problem of the diarrheas of infancy and early childhood has been one of intense interest. As a result there has been a progressive decrease in mortality and morbidity of the disease which in the past accounted for as many deaths among infants as other causes combined.[1] Recently, however, an increase in morbidity has been noticed in many institutions and in general practice and has caused much anxiety. This anxiety has prompted many to conduct searching analyses of the situation and much material regarding cause and treatment has appeared in the literature.

Inasmuch as infants are more likely to develop diarrhea than are adults,[1] the reasons for this must be appreciated. A discussion of causes and treatment can then be undertaken.

The gastrointestinal secretions in the infant differ from those of the adult. The gastric juice contains less pepsin, rennin, and very much less hydrochloric acid. This gastric juice is perfectly suitable for the digestion of human milk with its small curds and low buffer action and leaves enough acidity in the upper gastrointestinal tract to stop bacterial growth. It is thought that this acidity frees the upper gastrointestinal tract from bacteria that would be capable of causing gastrointestinal disturbances.[1] This is one reason for rarely seeing severe diarrhea in the breast-fed infant.

There are circumstances that diminish the gastrointestinal secretions, and when the small amount of acid normally present in the upper gastrointestinal tract is diminished, bacterial growth is invited. Cow's milk, with its high buffer action, lowers the acidity and allows bacterial infection, particularly with the colon bacilli. These bacilli may cause the serious symptoms of diarrhea and vomiting when invading the upper gastrointestinal tract, although they cause no symptoms when they remain where they belong in the lower intestinal tract.

In diarrhea the stools are usually acid in reaction, but this does *not* mean an acid condition in the upper gastrointestinal tract. These acid stools usually cause sore buttocks from outside contact as well as an irritated and sore colon, which in itself will aggravate diarrhea. This strongly acid stool is caused by the unabsorbed fermentable carbohydrates that reach the colon because they have not been digested in the upper gastrointestinal tract, for reasons already mentioned. Upon reaching the colon these fermentable carbohydrates are attacked by the abundant flora normally present. The reaction of this meeting is fermentation with its acid debris as a result.

CAUSES OF DIARRHEA

The causes of diarrhea may be listed in order of frequency as:[2] (1) Parenteral infection, (2) enteral infection, (3) malnutrition, (4) overfeeding, (5) poor feeding, (6) gastroenterospasm, (7) underfeeding, (8) allergy. These will be discussed in that order.

In making a diagnosis, many of these conditions can be eliminated quickly by a careful history. Such a history will reveal whether or not any upper respiratory condition has been present. This type of parenteral infection is the most common cause of the diarrheas of infancy and early childhood. Otitis media, pharyngitis, tonsillitis, and bronchitis can easily upset the mechanisms of digestion. If one is able to rule out parenteral infection as a cause of the diarrhea in a child that is running a high fever, bacillary dysentery should be suspected. This condition will be discussed with enteral infections.

Enteral infections include: (1) Epidemic diarrhea of the newborn, (2) bacillary dysentery caused by Shigella, (3) infections due to Salmonella introduced by mouth, and (4) infections with Streptococci, bacteria of the proteus group, and possibly with gas bacilli when introduced by mouth. A discussion of these bacterial factors follows in order.

Epidemic diarrhea in the newborn is difficult to diagnose in the first patient or two because of its insidious onset. It usually is not diagnosed until after others have become ill, or until after one infant dies. By this time an epidemic is usually in full force within the hospital nursery.[3] In that this is a disease of the newborn, it is first necessary to know what the normal stool of the newborn infant should be, in order to determine what is pathologic. The stools will vary in quantity and color in a normal infant. For the first few days of life, one to four meconium stools a day occur, and then an infant may have as many as six or seven stools a day and be perfectly normal. This increase occurs as the intestinal tract becomes irritated by the addition of oral feedings and the establishment of the normal bacterial flora. However, epidemic diarrhea must be considered when two or more infants have an otherwise unexplained deviation from normal bowel action.

This diarrhea has an etiology as yet to be definitely determined. Recent experimental investigations have shown it to be of virus origin,[4] but cultures have so far been negative. Postmortem examinations have shown relatively few changes, and nothing pathognomonic.[5]

The symptoms of epidemic diarrhea in the newborn should be divided into stages.[5] The incubation period is usually from 1 to 21 days followed by the stage of invasion. The onset is insidious in the early cases in an outbreak and more acute in the later stages of the outbreak. Prodromata are anorexia, lack of gain or loss of weight, occasional vomiting, listlessness, general symptoms of toxicity, and stools that are loose.

The toxic stage follows. It is characterized by marked loss of weight, dehydration as shown by sunken eyeballs and fontanels, drowsiness, coma, watery yellowish stools (no blood or pus, little or no mucus), abdominal distention, slightly elevated temperature, and no sign of parenteral infection. Death may result in 1 to 34 days, and usually does in about 50 per cent of the cases.[5]

There is a diarrhea of the newborn which is frequently associated with stomatitis.[6] This begins at about the second week. The mother states that the baby has a sore mouth and will not eat. The condition looks like thrush, but does not respond well to the usual gentian violet therapy. In these cases the stool

*Presented at the annual convention of the Massachusetts Osteopathic Society, January 18, 1948.

contains mucous material and is greenish colored and semiliquid.

Epidemic diarrhea of the newborn must be differentiated from parenteral infection, intestinal upsets from improper feeding, sepsis of the newborn, and primary enteric disorders due to organisms of the Salmonella and dysentery groups.

The next infection to be discussed is bacillary dysentery.[7] This is an infectious disease caused by Shigella. Pathology is chiefly in the large bowel. One of the principal causative organisms, particularly in children, is the Shigella sonnei. Other bacilli of the Shigella group, particularly that of Flexner, are frequent offenders. The disease is characterized by fever, toxicity, abdominal pain, and diarrhea containing mucus, pus, and blood. There are many forms of the disease running from a very mild course to one of severe toxicity with high mortality. A provisional diagnosis is usually made in an infant or child having fever, toxicity, and dysentery with stools containing blood and pus. Stool examinations with isolation of the organism by culture provide a definite diagnosis.

The third type of infections are those of the typhoid group and those due to Salmonella. They may closely resemble bacillary dysentery and may have to be differentiated by the laboratory. Salmonella produce typhoid-like disturbances or an acute gastroenteritis (food poisoning). There are many species of Salmonella, but the majority of human infections are caused by only a few of them. The diagnosis of the typhoid-like infections is difficult. A bacteriological diagnosis must be made by isolation of the organisms from the blood, stools, or urine. Demonstration of an agglutinating titer of significance in the patient's blood serum may also be diagnostic. Food contaminated by the Salmonella which produce food poisoning or dysentery will show the organisms upon culture.

Other enteral infections causing diarrhea are those due to Streptococci and bacteria of the proteus group. Possibly the gas bacillus is a causative factor. However, these diarrheas are of short duration and are not frequently accompanied by severe manifestations.

If the diarrhea is chronic and the child is obviously undernourished, the cause may be malnutrition. In such cases the stools are of a very dark matter. Overfeeding is accompanied by diarrheal stools of large quantity; the amount is far in excess of anything that a normal child passes. A careful history regarding the type and amount of feeding will eliminate overfeeding or poor feeding as the cause of diarrhea. Failure to receive proper proportions of protein, carbohydrates, and fats could well be the cause of the difficulty. Gastroenterospasm is also associated with chronic diarrhea of annoying type; it is accompanied by colic and vomiting.

Underfeeding produces diarrhea by the mechanism of decreased blood volume and, therefore, decreased blood flow. This combination produces a condition which is not conducive to good secretion of gastric juices. Proper glandular function, in order to produce the gastric enzymes, is dependent upon proper nourishment. This principle of proper nourishment being necessary for proper function is an osteopathic principle which must always be kept in mind. A decrease in gastric enzyme secretion does not allow for proper digestion of the limited food that is given in cases of underfeeding, consequently there is decreased absorption of the food that is given. Decreased absorption results in more material to be putrefied with resulting diarrhea. The mechanisms of underfeeding diarrhea are similar to overfeeding, in that there are abundant end products to cause fermentation. Any food consumed or bacteria introduced with resulting decomposition of food remnants may result in diarrhea.

Allergy which causes diarrhea is usually due to milk or egg protein sensitivity.

TREATMENT OF DIARRHEA

Treatment of diarrhea of infancy and childhood, regardless of the cause, is basically the same and includes starvation, maintenance of body fluids and electrolytes, and an attempt at inhibiting or killing the offending organism.[8] In epidemic diarrhea of the newborn, treatment consists first of starvation for at least 12 hours and intravenous feedings of dextrose and sodium chloride as necessary to produce proper hydration.[9] Hydration is measured by urinary output and blood concentration. After the blood has been properly diluted, sulfonamide therapy, if indicated, may be begun, but not before. Opiates may be given if necessary for relaxation, and vitamin K is believed to be of benefit.[10] In severe cases plasma and whole blood are advantageous as is penicillin, 12,000 to 24,000 units per day in divided doses every 3 hours. The sulfonamides producing best results have been found to be succinylsulfathiazole, sulfaguanidine and sulfathaladine.[11,12] Many cases of mild diarrhea are best treated by starvation and the addition of water by mouth if vomiting is not present. In such cases intravenous therapy would not be necessary, and small amounts of skimmed milk may be added after 12 hours.

A significant advance in the treatment of diarrhea was reported by Govan and Darrow[13] who found that greater control over the condition was made possible by adding potassium chloride to a solution of sodium chloride for intravenous use. Lack of potassium causes paralysis and loss of muscle tone and, consequently, lack of cardiac tone. Therefore, cardiac embarrassment is a frequent cause of death in infants with diarrhea. Intracellular potassium must be maintained for good nerve function.

The procedure used by the two writers was to first use in severe cases plasma or whole blood with an equal volume of physiologic saline. In mild cases only saline and glucose were given intravenously. During the first 24 hours, after the initial hydration, replacement of most of the deficit of body water and electrolyte was attempted by the injection, subcutaneously or intravenously, of from 80 to 150 cc. per kilogram of body weight of the mixture of potassium chloride, sodium chloride, and sodium lactate which is now known as Darrow's solution. The rate of injection varied, but usually the estimated dose was given in from 8 to 12 hours by slow drip. Enough 5 per cent solution of glucose was given intravenously to make the total water intake from 150 to 280 cc. per kilogram of body weight. After the first day smaller amounts of Darrow's solution (from 20 to 50 cc. per kilogram of body weight) were given daily as long as the stools remained watery. In addition a sufficient amount of 5 per cent glucose solution was injected intravenously to make up a total fluid intake of from 150 to 200 cc. per kilogram of body weight. The formula for Darrow's solution is as follows: Potassium chloride 2 grams, sodium chloride 3 grams, molar sodium lactate 40 cc., and water 710 cc.

Nothing was given by mouth for from 24 hours to 6 days. Feedings by mouth were started only when the stools were no longer watery. Amino acids were added to the fluids without obvious effect. Upjohn's solu-B was added to the glucose solution in a majority of cases. All patients were given 1 cc. of crude liver extract twice a week.

Darrow's solution apparently allows the infant to withstand very severe diarrheas that heretofore have been fatal. According to the New Haven Hospital and others that have used the solution, the death rate has been reduced by one-third by its use.

If diarrhea is due to bacillary dysentery or one of the other infectious organisms and this can be proved by culture, the proper sulfonamide,[12] if advisable, may be used, but the principle of starvation and replacement of body fluids is still fundamental. If vomiting persists as well as diarrhea, parenteral feedings to maintain nutrition must also be used. In the mild diarrheas that are more commonly seen in general practice the same principles must be observed.

If a mother calls and states that her infant or young child has diarrhea, with or without vomiting, the first thing is to tell her to offer nothing by mouth. History and physical examination should then reveal a cause. If it is parenteral infection, it should be treated as such. When the vomiting ceases water in small amounts may be offered and in 12 to 24 hours skimmed milk or buttermilk may be added as the first food, if the diarrhea has subsided. The use of sedatives, such as paregoric and bismuth preparations, does not have much place in the treatment of small infants. They are of some value, however, in the older child. Kaolin is useful also in the older child, but not in the infant. Keeping in mind the disturbances in physiology which were discussed early in the paper and which were given as a cause of diarrhea, it can be readily said that osteopathic manipulative therapy has a prominent place in the treatment of the diarrheas of infancy and childhood. Manipuation should be directed to those areas of the spine segmentally related to the splanchnic nerves, as well as to other centers of sympathetic and parasympathetic nervous control. By normalizing the areas of control for the formation of gastric and intestinal enzymes, an attempt has been made to aid proper digestion. Well-digested food does not leave much debris to be acted upon by a normal bacterial flora or by invading bacteria.

SUMMARY

We have discussed the causes and treatment of diarrheas of infancy and early childhood. The causes are numerous, the most common cause being parenteral infection, followed by enteral infections, and, finally, poor feeding. The basis of all treatment is starvation and maintenance of body fluids by mouth, if there is no vomiting, or by intravenous feedings of sodium chloride and glucose with Darrow's solution. Specific infections should be combated by antisera, sulfonamides, penicillin, and osteopathic manipulative therapy to provide normal nutrition to the involved visceral areas.

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EASTERN OSTEOPATHIC ASSOCIATION CONVENTION, APRIL 3 AND 4

The twenty-seventh annual convention of the Eastern Osteopathic Association will be held April 3 and 4 at the Hotel Pennsylvania, New York City, according to the program chairman, Dr. Chester D. Losee of Westfield, N. J.

Dr. Robert B. Thomas, Huntington, W. Va., president of the American Osteopathic Association, and Dr. Arthur E. Allen, Minneapolis, a past president of the national Association, are among the noted speakers scheduled to present scientific papers before this eastern group. The complete program, as published in advance, is as follows:

SATURDAY, APRIL 3
MORNING

9:00 Athletic Injuries—Head and Trunk
Arthur E. Allen, D.O., Minneapolis

9:50 The Osteopathic Management of Osteoarthritis (Hypertrophic)
Herman L. Samblanet, D.O., Canton, Ohio

10:40 Biophysics in its Practical Application for the Osteopathic Physician
Robert T. Lustig, D.O., Grand Rapids, Mich.

11:30 The Diagnostic Importance of Lesions in the Upper Gastrointestinal Tract
Arthur M. Flack, Jr., D.O., Philadelphia

AFTERNOON

2:00 The History of Osteopathy
Chester D. Swope, D.O., Washington, D. C.

2:50 Psychosomatic Medicine—Part I
A. E. Wilkinson, D.O., Montreal, Quebec, Canada

3:40 The Psychology and Technic of General Practice
Henry S. Liebert, D.O., Richmond, Va.

4:30 Business Session

4:40 Technic Session
Dr. Arthur E. Allen
Dr. Robert T. Lustig
Dr. Herman L. Samblanet
Dr. A. E. Wilkinson

SUNDAY, APRIL 4
MORNING

9:00 The Atlanto-Occipital Lesion—with slides
Robert B. Thomas, D.O., Huntington, W. Va.

9:50 Athletic Injuries—Arm and Leg
Arthur E. Allen, D.O., Minneapolis

10:40 Osteopathy in Neuro-Endocrine Disorders
Herman L. Samblanet, D.O., Canton, Ohio

11:30 The President of the A.O.A. Reports
Robert B. Thomas, D.O., Huntington, W. Va.

AFTERNOON

2:00 Indications and Interpretations of Common Laboratory Procedures
Boyd B. Button, D.O., Philadelphia

2:50 The Nature of Disease—An Electrochemical Analysis Based upon Personal European Investigation for the United States Government
Robert T. Lustig, D.O., Grand Rapids, Mich.

3:40 Psychosomatic Medicine—Part II
A. E. Wilkinson, D. O., Montreal, Quebec, Canada

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SUPPORT OF OSTEOPATHIC RESEARCH AN INVESTMENT IN OSTEOPATHY'S FUTURE

Every member of the profession should read thoughtfully the article beginning on page 369 in this JOURNAL. The writer, Irvin M. Korr, Ph.D., scientist and member of the faculty of the Kirksville College, is not a doctor of osteopathy; nevertheless, his investigations of the osteopathic lesion with electromyographic equipment in the research laboratories of the Still Memorial Research Trust have convinced him that the theoretical basis for osteopathy is sound. His splendid article on "The Neural Basis of the Osteopathic Lesion" in the December, 1947, JOURNAL is an affirmation of this conviction.

In the current issue Dr. Korr proclaims that the future of osteopathy depends upon fundamental research which will lead to the continuous evaluation of superior diagnostic and therapeutic methods. He points out that the results of electromyographic research of the lesion, limited as they are as yet, indicate "that osteopathy is ready to be transformed from a subjective, qualitative healing art into a precise, quantitative, and objective science, with an infinitely widened range of usefulness, certainty, and predictability." He says that research must be stepped up in tempo and in power, that fundamental research on the scale required is expensive but it is the best long-term investment the profession can make.

There is a special urgency for more extensive research into osteopathic concepts at the present time. As pointed out many times previously in the editorial columns of THE JOURNAL and again by Dr. Korr in his article, the intrinsic nature of the osteopathic lesion is being studied in numerous nonosteopathic laboratories. "The ploughing and planting by others," Dr. Korr says, "of the rich fields which so closely adjoin those first broken by Still should not be viewed only as a threat to (or an encroachment upon) the distinctive position of osteopathy in the art and science of healing. Rather it should be viewed as a tremendously historic opportunity which is being forfeited to others. The profession need only reclaim that opportunity. Further, and most important, the osteopathic profession has an immense advantage. The others are just discovering the osteopathic lesion in one form or another. . . . The D.O.'s have not only known the lesion and its functional effects for a long time, but have dealt with it effectively for more than half a century."

Dr. Korr proposes a three-point research program, embodying the following elements:

"1. There must be the fullest utilization of existing scientific resources and facilities, and continuous improvement and expansion of these resources.

"2. There must be large centralized research facilities and laboratories.

"3. There must be centralized planning and coordination."

The establishment of such a research program, he estimates, would require an annual budget of no less than $100,000. While this may seem fantastic and beyond the means of the profession, he points out that there are even now probably at least 1,000 physicians who would be "happy to pledge $100 annually for a research program which they could call their own and which would be directed toward their needs."

This money should be used not only to carry on fundamental research on the osteopathic lesion, but also to finance fellowships for talented young D.O.'s in basic sciences and research methods to insure a steady stream of well-qualified teachers and research workers for osteopathic institutions. The fellowships should carry a sufficient stipend to provide security to each Fellow and his family, and at least partially offset the economic sacrifice he makes in withdrawing from practice.

Whatever the osteopathic profession has undertaken earnestly to do in the past it has accomplished eventually. The urgency for an adequate research program has been pointed out. A plan has been outlined. Financial backing is what is needed now.

THE PHYSIOLOGY OF COMPULSION

One of the outstanding unsolved problems of medicine today is the anatomicophysiologic basis of the neuroses. Because nothing tangible has been demonstrated so far that offers a positive explanation for the phenomenon, hypotheses of all kinds have been proposed. These theories range from extreme dynamic concepts to equally extreme organic ideas. The genius of Freud gave structure to mind in the midst of a materialistic world and served well to direct research into channels aimed at the neuroses. So much work has been published showing the intimate relation of the autonomic nervous system to the neurotic syndrome that many students of the problem link the two together. Much of modern psychosomatic research is in this field, for that which is emotionally motivated must be autonomically activated. Hence, studies of the autonomic nervous system give objective evidence of the emotional activity of the body.

There is ample evidence of the autonomic nervous system being a correlate of the compulsive phenome-

non. Under the stress of an acute compulsion, the subject will perspire, be tense and restless, show evidence of gastrointestinal disturbances, tachycardia, and vasomotor changes. Many neuroses are built upon and around the compulsive constellation, and the cycle of such neuroses is the cycle of the compulsion. Very little data has appeared in the literature dealing with the compulsive peak, regardless of whether the compulsion considered is criminal, alcoholic, motor, phobic, or one of anxiety. This is strange because abnormal acts occur at the peak, and when one considers the extensive socio-religio-emotional and economic involvement of compulsive behavior, it would appear to be a research objective of prime importance.

One of the few studies on the subject is that by Friedman,* the results of which were published in *Psychosomatic Medicine*, July, 1947. In this article the author reports a study of 62 hospitalized patients suffering with neurocirculatory asthenia. The study was made over an average period of 26 days. Forty-eight, or 77 per cent, of the patients experienced at some time during their hospital stay an attack of episodic neurogenic discharge. These attacks occurred while the patients were at rest, and seemingly refuted theories that the syndrome of neurocirculatory asthenia resulted from the expenditure of effort alone. This study further implied that some part of the central nervous system was implicated; it would seem that that part would be closely related to centers concerned with adrenergic and cholinergic functions.

What Friedman has observed in neurocirculatory asthenia can be discerned in other neuroses, especially the compulsive states. My personal experience would indicate that compulsion is accompanied by a phasic characteristic of such a nature that it can be charted, and that the high points of the cycle will recur with startling regularity and similarity. What Friedman terms a neurogenic discharge, I have observed clinically as a manifestation of compulsion in many different forms. So far, however, I have not been able to demonstrate any objective evidence of this discharge other than signs of autonomic tension. The electroencephalograph fails to record these peaks, at least with the equipment available now. Much speculation prevails.

A few unanswered problems brought into relief by Friedman's work may be posed by the following questions:

Does the neurogenic discharge he has observed in neurocirculatory asthenia also occur in other neuroses? If so, how much of the subjective syndrome is due to it and how much to dynamic factors?

In what way are subjective and objective factors related if such be the case? And, what can be done about this episodic neurogenic discharge?

These and many others are natural enquiries on the part of physicians treating patients with compulsive neuroses. Perhaps the answers will also aid in the practical aspects of their problem.

THOMAS J. MEYERS, M.A., D.O., F.A.C.N.

*Friedman, M.: Studies concerning the etiology and pathogenesis of neurocirculatory asthenia; episodic neurogenic discharge as a manifestation of the syndrome. Psychosom. Med. 9:242-245, July 1947.

THE COLLEGES ARE THE RESPONSIBILITY OF EVERY DOCTOR OF OSTEOPATHY

The total of pledges and payments to Osteopathic Progress Fund continues to increase although too slowly. Many members have contributed to the fund, some giving generously to all the colleges and others with equal generosity, to a single institution. Some have given out of sheer loyalty to the profession, some because of gratitude to a school which put them on the road to serve. Others contributed because they recognized a need to train successors and to expand the benefits inherent in osteopathy to a public that needs help. Again, there are those who recognize the necessity of adequate osteopathic education as a basis for every recognition of osteopathic physicians, governmentally in state and nation, in industrial and insurance medicine, in the world of education, and in every situation where a physician is judged by his educational background. A few give only because they realize it is a must for the survival of the profession. Most do their part for all of these reasons.

Analysis of hundreds of cases reveals that failure to participate is for the most part based on utter lack of the realization of the necessity for steadily improving osteopathic educational facilities and the cost of such a program. A few, and a few indeed there be, are convinced they are too poor to help.

No person, knowledgeable of the financial situation in each of our schools (and for that matter in old-school medical colleges), can evade the need. No one, familiar with the program of any approved osteopathic college, can argue that their plans for improvement are not, in the main, indicated and warranted. No one who buys anything can escape the proven conclusion that osteopathic education today costs the schools 30 to 50 per cent more than it did back in 1946 when present quotas were set. No one disputes that our schools today are doing a better teaching job—at least no one familiar with the activities disputes it.

And so progress is being made. Gradually divisional societies, not before well organized to do a good job of telling the whole story to all their members, have begun to come to grips with the problem of reorganizing their machinery to do a complete job of meeting the quota assigned. Indeed, in this effort, some divisional societies have come to recognize their own weaknesses, and an O.P.F. campaign has indicated needed improvement in their whole organizational setup.

Some divisions, at the beginning of the campaign, without fuss or fanfare, raised a large proportion of their quota and since have carried on quietly to complete the job. Other states, hesitating when the campaign started, have since really organized to press the issue with every member. Missouri is a good example. The Florida, New York, and Texas Associations plan soon for the kind of able effort of which those organizations are capable.

These few paragraphs will be read individually by readers of THE JOURNAL. They are written for individual, quiet, thoughtful consideration. They are intended to indicate the responsibility of every Doctor of Osteopathy, to his profession, to its improvement and its perpetuity.

R. C. MCCAUGHAN, D.O.

SPECIAL ARTICLE

A Research Program for the Osteopathic Profession

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PART I

During my first few days at Kirksville College of Osteopathy and Surgery, in the course of being introduced to the osteopathic lesion by Dr. J. S. Denslow, I caught a glimpse of osteopathy in transition—of the osteopathy of today and of the osteopathy to be. I watched the palpation of the spinal columns of a number of subjects and heard some of the segments designated as lesioned. However, I found myself unable, at the time, to detect the distinguishing features of the lesioned segments. Even expert guidance could not, in a few days, compensate for untrained fingertips dulled by years of skepticism and prejudice.

Then I watched a coldly objective group of instruments, in the form of electromyographic equipment, unequivocally demonstrate that the segments subjectively determined by Dr. Denslow to be lesioned, were indeed different from the others. Furthermore, it quantitatively measured the severity of the lesion. Even more important, from a scientist's viewpoint, it yielded information regarding the fundamental basis for the difference. A lesioned segment, whatever else it may be, was one with a low motor reflex threshold; the more severe the lesion, the lower the threshold. Still more important, a key was provided for further and deeper investigation of lesion mechanisms.

That striking demonstration was an epitomization to me of the accomplishments of a program of fundamental research in osteopathy and of the potentialities of further research. Here, in progress, was the conversion of an art into science. Here was a major step from empiricism to experimentally established theory. Here, in the theory, was the seed of new and better practice.

In the few succeeding months of continued investigation some of the potentialities have been explored and the way has been pointed, we are confident, to some very significant and practical advances. Yet, in the same period of time, it has not been possible to detect any substantial recognition by the profession of the potentialities of fundamental research. There is little generalized appreciation of the nature of fundamental research in osteopathy, of its potential impact on the practice of osteopathy, and of its relation to the future of osteopathy as a profession.

This conclusion is supported by two main facts. First, basic research in osteopathy is pitifully small in comparison to what osteopathy needs and can support. Second, certain serious misconceptions are prevalent. One hears the statement, even from distinguished leaders of the osteopathic profession, that fundamental research is academic, impractical, sterile, useless. This is usually accompanied by the demand for more practical work, "Give us better diagnostic instruments; new therapeutic tools." (With this, of course, there can be no disagreement. But what is the shortest path to those practical advances?) One hears also that the main value of basic research lies in public relations; it is good window dressing; it lends "respectability" to osteopathy, its institutions, and practitioners. Others, with a glance at Osteopathic Progress Fund, assert that research is an expensive luxury; leave it to those who can afford it.

The most common misapprehension, and the source of much cynicism with respect to research, is that the function of research is to "prove" osteopathy. This is patently false; osteopathy is very satisfactorily "proved" to thousands of grateful patients daily. On the contrary, the sole, ultimate, function of research in osteopathy is not to *prove* osteopathy, but to *improve* osteopathy—to render osteopathy a more effective weapon for the prevention, healing, and compensation of man's ills.

What *is* fundamental research? Research is said to be conducted on one (or both) of two levels: (a) the basic or fundamental (often misnamed "pure") and (b) the practical or developmental. The first is concerned with the properties, the processes, the interactions, the interrelations, and the energy transformations of matter—at all levels of organization—whether that matter be the helium atom, the earth's core, the stratosphere, the vertebral column, or the human cerebral cortex. Practical research proceeds from the newly revealed laws to develop or create devices, instruments, or technics for the fulfillment of certain practical purposes. Practical research cannot progress very far without constant "transfusion" with new fundamental knowledge. Often the boundary line between the fundamental and the practical is nonexistent. Although the practical proceeds from the fundamental, it opens new fundamental problems. Theory leads to practice, but is in turn enriched by practice.

Striking illustrations of the relation of fundamental to practical research as they applied to both materiel and personnel were furnished by the last war. A host of phenomenal war machines and gadgets sprung up during or shortly before the war: radar, proximity fuses, self-aiming projectiles, and, of course, the atom bomb. It is too often forgotten, however, that the developmental work which led to the final product was in each case made possible by the decades of basic research that preceded. Thus, radar really began to emerge with the discovery of electromagnetic waves by Hertz over 60 years ago. The atom bomb really began to be built by the Curies, with their discovery of radioactivity. In fact none of the startling weapons of war which gave this country its technical superiority would have been possible without the tremendous backlog of information previously yielded by basic research—often unrelated to the final product.

The critical need for basic information was even more clearly demonstrated in connection with personnel problems in the war—because in many cases the backlog was inadequate. In the course of the war hundreds of unanticipated problems arose concerning man's relation to the new war machines and to the conditions, climactic and others, under which he fought and operated. Attempts were made to solve these problems early in the war by what appeared to be the most direct approach. Change it; test it; keep changing and testing until it comes out right. Effective and important as this was in many cases, too many others did not

come out right. Many of the most urgent problems remained unsolved by this pragmatic field research; the work ended in blind alleys. After much of such unsatisfactory, empirical "prodding," the various divisions of the armed forces began to establish in their own laboratories and through civilian agencies an extensive and far-flung network of fundamental research projects. The air forces were conducting research on cerebral metabolism and circulation, oxygen dissociation curves of hemoglobin, hemodynamics, and retinal mechanisms. The Signal Corps was conducting studies on the metabolism of muscular work, on the shivering mechanism, and control of blood flow through the skin. The Quartermaster Corps was conducting research on radiation and evaporation from the skin, salt and water balance, and endocrine function under various climatic conditions. The Chemical Warfare Service was engaged in basic studies on cellular metabolism in plant seedlings and chick embryos, on acetylcholine synthesis, and the mechanisms of myoneural transmission. In many cases the research had no apparent relation to the immediate practical problem. Yet, quickly, the answers to the most urgent problems began to be found. In many instances the disclosure of a single new fact or set of facts solved a number of apparently unrelated practical problems, merely because they had some fundamental factors in common.

Thus, one of the most important lessons of the war for the medical and biological sciences is that the quickest, the most economical, and most effective way to solve practical problems concerning the human organism is through fundamental research. It is a most dramatic fact that the very practical armed forces, in the midst of one of mankind's greatest emergencies, a war for survival, found it expedient to put the medical and biological scientists to work on apparently "pure," "academic" projects.

Does this lesson apply to osteopathy? I sincerely believe that it does. The laws describing the vital processes in man's body are the same whether the body is that of a soldier operating a radar set, that of an M.D.'s patient or that of a D.O.'s patient. We must fully recognize that osteopathic manipulative treatment, though its effectiveness in the healing of man's bodily ills is demonstrated in daily practice, is still largely in the stage of empirical "prodding," as, of course, are many other forms of therapy. History shows that empiricism, though it may play an important exploratory role in the opening of a new field, operates under the law of diminishing returns and rapidly runs its course. Osteopathic empiricism (and therefore empirical osteopathy) is rapidly and inevitably approaching its limit. The limit, however, is not inherent to osteopathy, which is potentially limitless. The limits are today being set by the available theory—which is in dire need of enrichment by fundamental investigations.

But did not Dr. A. T. Still leave a large body of theory? He did indeed leave a revolutionary body of doctrines, the intrinsic soundness of which has made possible the successful practice of osteopathy as we know it today. But Still recognized also the stultifying effect of absolute, unchanging—and therefore nonliving—dogma. He left to his successors a great heritage of principles—to be applied, developed, enriched, multiplied—and amended. He said he had but scratched the surface. After a half century the surface is still only scratched. There are more scratches, but they are not much deeper. This is not to deny the advances and improvements in diagnostic and therapeutic technics. But it is to say that during this period there has been little alteration, little advance in our understanding of basic mechanisms involved. Practice has ceased to enrich theory—and will therefore be limited by theory. We are in the process of ploughing and reploughing fields first broken by Still. True, they are being worked with better and fancier tools, but vast new fields ever remain to be broken. The fresh, unimpoverished soil will inevitably yield a superior product. As will be indicated later, those fields are today being ploughed and planted by others. Some of the more important fields very closely adjoin those first broken by Still. Yet osteopathy cannot do the reaping nor will it be able to claim the product as its own.

What justification is there for asserting that osteopathy today is in urgent need of extension and deepening of our understanding of basic osteopathic concepts? I believe it a very significant fact, for instance, that recently a textbook of osteopathy which is over 40 years old was considered, by some of the older leaders of the profession, to have not only historical significance, but also theoretical and practical relevance today. This is true of no other biological field today.[1] It is tempting to make the defense that such a situation is attributable to the perfection, the absoluteness, and the comprehensiveness of the principles developed by Still and his early disciples. But the fact is that there are no perfect, absolute, unchanging principles. Even the laws of thermodynamics, which appear to be so final and irrefutable, are daily undergoing change, development, and enrichment in meaning. The laws of gravity, first enunciated by Newton, revolutionary and significant as they were, took on completely new meaning and usefulness in the light of the revolutionary principles of relativity, quantum mechanics, and nuclear physics. Osteopathy, also a revolutionary and vital doctrine, is still in an early stage of development. Only basic research, on an extended scale, can raise and maintain it at the highest level. In the field of physics it is leading to the control of atomic energy. The developments in osteopathy could be as spectacular.

Our small theoretical advance since Still's time is even more clearly reflected, I believe, in the current concepts of the osteopathic lesion. It was a striking revelation to me that after 50 years of direct or inherited experience in identifying, localizing, describing, and correcting osteopathic lesions, a group of progressive leaders in the profession recently found themselves unable to agree upon the distinctive characteristic of the osteopathic articular lesion. To one, the anatomical change assumed most prominence; to another, altered range of motion was the distinctive feature; to another, anatomical features were of negligible significance superseded by alterations in tissue texture, or hyperesthesia, or neurological changes, or combinations thereof. The most careful empirical prodding and clinical testing of lesions will not yield the essence of the osteopathic lesion, the intrinsic, central factors which lie at the center of, and tie together all the peripheral, palpable, and clinical manifestations.

1. In fact, in our own colleges we would not be content with any but the latest editions of textbooks of medicine, surgery, pathology, physiology, etc.

The disclosure of that essence, the fundamental basis of the osteopathic lesion, is the very purpose of the research program in progress at Kirksville. Proceeding from the pioneer demonstration by Denslow and his colleagues that the lesion is associated with reduced reflex thresholds, it has been possible through further investigation to learn considerably more about the basis for the low reflex threshold in the lesioned segment, its relation to other parts of the nervous system, central and autonomic, and about features intimately correlated with threshold. As a result of these investigations[2] a new concept of the osteopathic lesion is emerging. The lesion is demonstrated as being intrinsically a segment of the spinal cord which is in a state of chronic facilitation, a segment of the cord from which, so to speak, "the insulation has rubbed off," potentially exposing all structures innervated from that segment to overexcitation or inhibition.[3]

Although it is inevitable that further development of this concept will have some impact upon the practice of osteopathy, it is of special interest to clinicians that these beginning studies already have some conspicuous practical implications. In the course of the investigations some simple, inexpensive, and portable instruments were developed or adapted for the precise measurement of certain aspects of the lesion. I believe that these and others which are contemplated are destined, in one form or another, to become valuable diagnostic aids, far more revealing than the most sensitive finger tips and certainly much easier to standardize.

It is also safe to say, I believe, that such instruments could emerge only from fundamental study. It is most improbable that they could be produced by an empirical project in which the investigators deliberately set out to create diagnostic instruments without the necessary backlog of basic information.

Lest it appear that I have completely discounted the "public relations" aspects of fundamental research, which are overemphasized by others, it may be said that the profession can be proud that osteopathic research is rapidly becoming an integral part of the scientific stream of this country. Reports from this laboratory are published in the leading physiological and biological journals. A grant-in-aid has been assigned this college by the United States Public Health Service upon the recommendation of a distinguished group of physiologists. There are good prospects of grants from other agencies. For the first time a Doctor of Osteopathy presented a paper before the American Physiological Society, at its 1947 meetings; he will read another at the 1948 meetings. At those meetings a growing interest in osteopathy was evinced by the scientists. Dr. Denslow and I found it possible to break down the "resistance" of the most inveterate scientific skeptic in a few minutes by presenting the experimentally substantiated concept of the osteopathic lesion.

It is most important to emphasize, however, that important and gratifying as are the growing acceptance, "respectability," and improved "public relations," they are purely secondary and inevitable by-products of sound and significant research. The primary objective of the research is, and must ever remain, the discovery of sound osteopathic principles leading to the continuous evolution of superior diagnostic and therapeutic methods.[4]

The results of these investigations, small as they are as yet, clearly indicate that osteopathy is ready to be transformed from a subjective, qualitative healing art into a precise, quantitative, and objective science, with an infinitely widened range of usefulness, certainty, and predictability. Not only is osteopathy ripe for that transformation, but the information and theory which will make it possible lie fairly close to the surface. However, a vast amount of spade work remains to be done to uncover all the necessary facts. At the research tempo maintained by the profession today, the practical advances would be unnecessarily delayed for many years. As a matter of fact some of the more important problems are not solvable with our present low-power facilities. The research must be greatly stepped up in tempo and in power—and in the very near future. It must be admitted that fundamental research on the scale required is expensive. But it is not a luxury. It is today the best long-term investment the profession can make.

The investment in osteopathic research is already long overdue, and from the viewpoint of the osteopathic profession it now has a special urgency. That is, the investment is being made by others. The dividends are not to be expected to accrue to the osteopathic profession. It was said previously that research in osteopathic institutions is pitifully small, but it is most important to recognize that osteopathic research is proceeding on a grand scale in nonosteopathic laboratories throughout the world—especially in this country, Great Britain, and in the Soviet Union. True, it is not identified nor recognized as osteopathic, but it is osteopathic nevertheless.

In addition to the extensive studies on body mechanics which are carried on in many laboratories and clinics, the intrinsic nature of the osteopathic lesion is being slowly, but surely and accurately elucidated in many other laboratories. As early as the beginning of this century, in A. T. Still's day, Mackenzie[5] described in considerable detail the somatic relations (and the neural basis therefor) of visceral pathology. His descriptions closely resemble the modern description of the lesion, even to the tender spinous processes, and rigid and hyperesthetic muscles—segmentally related to the affected viscus. Lewis and Kellgren[6] have produced the equivalent of artificial acute spinal lesions and have studied not only the somatic effects, but also the relations to visceral and other autonomic functions. Recently a group of investigators at Cornell University Medical College were able to relieve certain severe

2. Reported in the *American Journal of Physiology* 105:229-238, Aug. 1947; this work and its clinical implications are reviewed also in THE JOURNAL OF THE AMERICAN OSTEOPATHIC ASSOCIATION 47:191-198, Dec. 1947.

3. This is by no means synonymous with "interference with nerve supply" so frequently ascribed to the lesion.

4. Osteopathic research and theory are not ends in themselves. The universal acceptance of osteopathy as a superior form of therapy will be predicated not upon the *theory* of osteopathy, but directly upon the *practice* of osteopathy. Osteopathy *is* what osteopathy *does*. This was very sharply illustrated by an incident at the 1947 physiological meetings. Having convinced one of my most skeptical friends, a very talented young physiologist, of the sound theoretical basis for osteopathy, our conversation turned to more personal matters. He informed me that his wife was almost incapacitated by what was a frank joint problem. He had spent all his savings, fruitlessly, on orthopedists' fees. I asked him, quite naturally, why he had not gone to an osteopathic physician. He stepped back, raised an eyebrow and asked incredulously (and perhaps a little contemptuously), "Are you serious?" Only after he recalled that one of his family's best friends was a regular and very satisfied patient of the sole osteopathic physician in his community, did he agree to give osteopathy a trial. I had sold him on the theory of osteopathy, but not on the practice. That is for the practitioner to do.

5. Mackenzie, J.: Some points bearing on the association of sensory disorders and visceral disease. Brain 16:321-354, 1893; also, Symptoms and their interpretation. Shaw & Sons, Ltd., London. Ed. 1, 1909; Ed. 4, 1920.

6. Reviewed in Pain, by T. Lewis. Macmillan Co., New York, 1942.

visceral symptoms by chemical treatment of segmentally related muscular "trigger spots." Their conclusions regarding visceral pathology resulting from somatic insult, and regarding the vicious cycle, etc., were strongly reminiscent of osteopathic views.

These are only a few examples; there are many others. Shortly after beginning my work at Kirksville, several colleagues, eager to introduce me quickly to osteopathic theory, thrust upon me copies of books by Pottenger, Judovich and Bates, Speransky, Livingston and others, with the invariable comment that this was "straight osteopathy."

At the other extreme are those D.O.'s who shout "usurpation." Their attitude, I believe, is even less defensible. There is a swelling tide of comprehension and practical interest in the phenomena long known to this school. The tide of trial and investigation by others cannot be made to recede upon command. Even if the osteopathic profession had the "secret" of the osteopathic lesion, it could not keep it long. It has had, however, for many years, and will for some time continue to have, the "know-how" of effective diagnosis and therapy of the lesion.

In certain respects osteopathy is in a situation very similar to that of the United States with respect to the atom bomb. This country does not alone have the secret of nuclear fission. It does alone have the practical know-how of the bomb. There is no question, however, that not only will atomic research throughout the world make possible the creation of atom bombs by other countries, but also the creation of atomic weapons far superior to the present bomb. The United States, then, has the choice (among others) of "sitting tight" with the present bomb and leaving the research to others (an obviously ridiculous choice) or of itself conducting fundamental research on an expanded, accelerated scale. (It is unfortunate that the comparison is with a weapon of destruction. A more fitting one would have been with atomic utilities for the elevation of standards of living and for the general improvement of man's personal, social, economic and cultural lot.)

A very similar choice faces the osteopathic profession today. There is no question that continued osteopathic research (whether or not it is designated as osteopathic) will inevitably lead to the development of new forms and methods of diagnosis and therapy superior to those of the osteopathy practiced today. The profession has the choice of leading the revolution or of having the revolution thrust upon it—with easily forseeable consequences. The profession has the choice of leading in the development of new and superior osteopathic weapons, constantly swapping the old for the new, or of sitting tight with the present ones (remarkably effective as they are) only to have them superseded anyway. To a very great extent the future of osteopathy and its recorded place in the history of healing will be determined by the choice. The wrong choice would constitute an unforgivable betrayal of A. T. Still and the founding principles which he left to his heirs. To delay the choice much longer is to make the wrong choice.[7]

The ploughing and planting by others of the rich fields which so closely adjoin those first broken by Still, should not be viewed only as a threat to (or an encroachment upon) the distinctive position of osteopathy in the art and science of healing. Rather it should be viewed as a tremendous historic opportunity which is being forfeited to others. The profession need only reclaim that opportunity. Further, and most important, the osteopathic profession has an immense advantage. The others are just discovering the osteopathic lesion in one form or another; they are just now becoming impressed by the influence of the soma on visceral function; they are just beginning to recognize the vicious somatic-visceral-somatic cycle. The D.O.'s have not only known the lesion and its functional effects for a long time, but have dealt with it effectively for more than half a century. This advantage must be consolidated, not only for the sake of the profession, but for all of mankind. What other group is better fitted by history, by experience and by tradition, to lead this next major advance in the science of preventing and healing man's ills?

For these reasons, to forfeit the opportunity is also to shirk a grave responsibility to society and to forego its everlasting gratitude and honor. For these reasons the research program of the osteopathic profession must be broadened and deepened and expanded many fold. An adequate research program would be the best possible tribute to the founder of osteopathy.

PART II

A research program which purports to serve an entire profession must embody the following elements:

1. There must be the fullest utilization of existing scientific resources and facilities, and continuous improvement and expansion of these resources.
2. There must be large centralized research facilities and laboratories.
3. There must be centralized planning and coordination.

Existing Facilities within the Osteopathic Profession.—There are already within the profession potentially rich sources and facilities for the disclosure of new and valuable basic and clinical information. I refer, of course, to the osteopathic colleges, in which research output is minute in comparison to the potentialities. Even at Kirksville, though a productive research program has been in progress for a number of years, it has involved but a very few departments and staff members. At present research is considered too much the specialized function of a "privileged few." This attitude must be replaced by the more correct one that every member of the faculty, with a little planning, and often only through recording observations which he makes in the course of his other duties, can make some worthwhile contribution to the knowledge or methods in his chosen field. It is most desirable that research, regardless of its scope or type (experimental, clinical or statistical) become a regular activity of as many departments as possible in each college.

The thousands of patients passing through our clinics and hospitals (including those who come to the autopsy table) represent rich sources of new and basic knowledge in osteopathy, disease processes and the functions of the human body. A wealth of such knowledge is irrevocably lost every day. Much of it can be saved by more careful and thorough record keeping. In other cases, it will merely require making certain simple clinical tests or observations before and after manipulative treatment, or in the course of therapy. In still other fields much fruitful work can be accomplished through cooperation of clinical departments

7. It is well to keep in mind in this connection, that if the osteopathic profession decides to leave the fundamental research to others, very probably when the history of the osteopathic lesion (whatever its ultimate name) is written, credit will go mainly to the researchers and their sponsors who establish and substantiate its fundamental and intrinsic nature, and not to those who empirically discovered its existence even though they knew how to exploit it practically. As has happened in other major scientific developments, the empiricists, though they may have been the pioneers and the first discoverers, figuratively and literally are mentioned only in footnotes, for the sake of scholarly completeness.

with one or more of the basic science laboratories. There are literally hundreds of osteopathic problems in cardiology, endocrinology, dermatology and the other specialties, which are amenable to experimental, clinical or statistical solution.

It is important to begin to stimulate research at each college, clinic and hospital. Discussion, at regular seminars and journal clubs, of the major problems in osteopathy and the approach to their solution in clinic, hospital and laboratory, is one suggested stimulus. It is further suggested that inducements, in the form of reduced routine teaching or clinical duties, and of salary increases be offered.

It must not be thought, however, that all that is required to do research, especially fundamental research, is the desire, the time and the energy. In addition to natural ability, imagination, ingenuity and an inquiring mind, it requires intensive and specialized training, experience, familiarity with scientific and clinical literature, new habits of thought and objectivity, and the capacity for painstaking attention to detail as well as to broad concept.

Sound and fundamental investigation of osteopathic problems requires not only training in the basic and clinical sciences, and in research methods, but a thorough grounding in osteopathic theory and practice. The profession suffers from a critical shortage of research personnel with these qualifications. Unfortunately, the research scientists trained in our universities and medical schools are not familiar with osteopathic concepts, and few physicians trained in our osteopathic colleges have an interest in research and postgraduate scientific training.

Until a sufficient number of persons embodying the proper combination of qualifications is developed, the closest collaboration between physicians and scientists must be established and maintained; this, of course, is desirable even under the best of circumstances. But our osteopathic colleges must begin to produce, as soon as possible, a steady stream of research workers.

This requires that our students receive good training in the basic sciences; that the courses in osteopathic theory and practice constantly incorporate the current advances in biological and medical science; that these courses not only be well taught, but that they be critically taught, with frank and inquiring attention to the uncertainties, the controversies, the gaps in our knowledge, the unanswered questions and the present limitations, as well as to the certainties. It requires that our students come in contact with sound research in the course of their studies, and that selected ones be given the opportunity to participate and be encouraged to prepare themselves for careers as teachers and research workers in the osteopathic institutions.

Obviously, the pump must first be well primed before such a stream of research workers is forthcoming. A cadre of qualified osteopathic research workers must first be established in our colleges, and given the means, to train others. Toward this end it is suggested that a system of fellowships be established by the profession whereby talented young D.O.'s may acquire the needed postgraduate training. These fellowships should permit them to go to any college, university, medical school or laboratory where they can obtain the desired training in the specialties of their choice, and for as long as is required. The fellowships should carry a sufficient stipend to ensure security to each Fellow and his family, and at least partially offset the economic sacrifice he makes in withdrawing from practice. Each fellowship must be viewed as an investment in osteopathy and its institutions rather than in an individual.

Centralized Research Facilities.—The tremendous value of highly concentrated research institutes has been amply demonstrated many times over in the progress, in the past 25 or 30 years, of the medical and biological sciences. Their importance was fully recognized by the armed forces. Although every branch of the armed forces profited from and constantly drew upon the investigations conducted in private and other laboratories throughout the country, each branch maintained its own concentrated facilities for the investigation of problems of importance to its special function. Thus, although medical and biological laboratories throughout the country were investigating various aspects of aviation medicine, the air arms of the Army and Navy operated large laboratories of aviation physiology. Similarly the Chemical Warfare Service maintained extensive medical laboratories; as did the Signal Corps, Quartermaster Corps, Armored Forces, and others.

Osteopathy has long been sufficiently mature to have a research institute of its own encompassing all the major fields of basic and clinical research related to osteopathy—biochemistry, biophysics, physiology, pathology, body mechanics, medicine, etc.

The primary function of an Osteopathic Research Institute would be to conduct intensive, full-time investigations of broad major problems not possible in the colleges, nor amenable to piecemeal solution by separate laboratories. Such a role would be made possible by three main features: (a) a high concentration of scientific and clinical talent; (b) well coordinated teamwork; concerted action; simultaneous investigation of the different aspects of each problem; and (c) the availability of rare, elaborate or expensive facilities and equipment not found in the colleges.[8] Such an institute would provide the highest degree of flexibility, versatility—and economy. Its contribution is not merely a quantitative one, but mainly a qualitative one. It makes possible not only *more* research but a different *kind* of research. The kind osteopathy needs —and deserves—is possible in no other way.

The institute should be so planned and so well supported as to attract and give maximum opportunity to leading scientists and clinicians. The institute should not, however, be considered as a plant or a factory in which "hired hands" grind out data *for* the profession. In every sense of the word the research must be done *by* the profession—of which the scientists must become an integral segment. The institute cannot be established as a separate department or instrumentality to which is relegated the special function of research, and in which the scientists operate in ivory-tower isolation from osteopathy in practice. The investigators must be conversant with the problems of osteopathy, its methods, potentialities, present limitations—and its history. This can be achieved only through constant contact of the institute staff with osteopathy and its practice. Planned interchange between the institute on the one hand, and the osteopathic colleges, institutions and the field on the other is therefore required.

For these reasons it is desirable that the Osteopathic Research Institute be closely associated with one

8. I have in mind such apparatus as an electron microscope for the study of cellular changes in areas of lesion; and of such equipment as that required for the study of the metabolism and distribution of natural substances "tagged" by radioactive isotopes.

of the colleges. While the institute would eventually require a modern, well-planned and well-constructed plant, it might be wise, during the early developmental stage, to house it temporarily in one of the larger osteopathic colleges. To hasten familiarization with osteopathic problems and theory newly engaged experimental investigators could be appointed to part-time faculty positions. Conversely, qualified physicians from the colleges and the field should be able to participate in the research program of the institute. Every laboratory in the institute should enjoy the fullest possible collaboration between specialized scientist and osteopathic physician. Physicians from field or faculty, as well as Fellows, should be able to come for training and experience in research, to conduct investigations of special interest to them, and thereby to enrich the research program with their own practical experiences. For similar reasons I believe it desirable that the director of the institute should be an outstanding Doctor of Osteopathy who knows the current practical and basic problems in osteopathy and medicine, and who will be advised by a board of distinguished scientists and clinicians in the various specialties. He must be a leader who can inspire confidence and esprit de corps and maintain a high level of coordination without encroaching upon the independence that every good scientist needs and demands.

The institute, for obvious reasons, should be close, geographically and organizationally, to extensive hospital and clinical facilities. A hospital which is specifically designated as a research hospital, or which at least provides opportunity for field research and for clinical testing and standardization of new developments, would be a vital adjunct to such a research institute.

Centralized Planning and Coordination of Osteopathic Research.—This is an indispensable element for the most productive utilization of facilities and for the planned growth of the research program. The Coordinating Committee on Osteopathic Research could be comprised of the Director of the Osteopathic Research Institute, his board of advisors in the institute, and qualified representatives from osteopathic institutions.

The committee would serve as the planning, coordinating and integrating agency for research in the entire profession, including the colleges. It would make a survey of the facilities and personnel at the various osteopathic colleges, hospitals and institutions and determine what types of investigations could best be conducted in the various departments in the different institutions. On the basis of the survey, it would propose projects to those departments, give aid and advice in their execution, and when necessary, recommend allocation of money from the Osteopathic Research Fund. It would also receive and review proposals for research and applications for funds, and make recommendations on the basis not only of merit and needs, but also on the basis of what work is in progress at other institutions. The committee would thus serve not only as clearing house and coordinator, but also as stimulator of research throughout the profession.

The existence of such a central committee, serving the entire profession, would make possible clinical surveys on a national scale, through the collection, compilation and analysis of data and clinical observations obtained and sent in by physicians throughout the country.

The coordinating function of such a committee is by no means synonymous with detailed direction. The need, in scientific research, for the highest degree of autonomy and independence of the individual laboratories and investigators would have to be fully recognized. The coordinated planning would, however, give direction to the over-all program, make possible maximum utilization of facilities and personnel, eliminate duplication of effort, make possible concerted effort on a large scale, and the solution of problems which cannot be approached in any other way.

This principle is today being applied on a national scale in cancer research. A centralized program is being established which will coordinate the work of laboratories and clinics throughout the country. There is no question that in a short time this will result in a tremendous advance in our knowledge of cancer, and therefore in its treatment, prevention and cure.

Admittedly, a research program having the above major elements, and of such magnitude as to be in keeping with the needs of osteopathy, and its place in the healing arts, would be costly. Such a program is possible only if it receives the strong support of the profession, its organizations and its patients.

To achieve this support—to "sell" research to the profession as a whole, it is necessary that every practitioner and his patients be fully informed as to what osteopathic research is; what it can promise with respect to diagnosis, therapy and concept; and what it will do for him and his practice. A program of research, on broad general lines, should be drawn up for presentation to the profession. It does not require intensive scientific training for a modern disciple of Still to conceive the effects on his profession of a thorough knowledge, for instance, of the intrinsic nature of the osteopathic lesion in all its aspects; or of its true mode of action on the autonomic nervous system; or of the relation of body mechanics to immunological processes in the body, and endocrine function; or of the prophylactic value of osteopathy (as, for instance, in a 30-year follow-up on 1000 children); or of the relation of the lesion to the cerebral cortex and the emotions; of the basic differences between the acute and chronic lesions; of the development of instruments and technics for the precise and objective evaluation of articular characteristics and tissue changes associated with lesions, etc.

What would such a program cost? From the beginning, the operation of the institute, the services of distinguished scientists and clinicians, and the support of projects in the colleges and other institutions, would require an annual budget of no less than $100,000. Lest this seem fantastically beyond the means of the profession, it is well to recognize that even now there are probably at least 1000 physicians who would be happy to pledge $100 annually for a research program which they could call their own and which would be directed toward their needs. I am confident that after a brief educational campaign among the profession and the laity the number and size of the pledges would be greatly increased.

It should be emphasized, too, that such munificent support would not be required of the profession indefinitely. Good research, based on good personnel and good facilities, attracts funds from a variety of sources. (This has already been demonstrated on a small scale at this College.) In view of the probable creation of a National Science Foundation in the near future, it is urgent that osteopathic research demonstrate its possibilities on a large scale very soon, so that osteopathy may justly claim its share of the funds that will be made available. It must be remembered that grants

from Federal agencies will be more in proportion to achievement and proven potentialities than to needs. Further, research institutes, limitless as they are in their potentialities, and enduring as are their products, attract endowments and memorial funds.

But research is more than just a financial investment. It is an investment in the principles of Still, in osteopathy and in mankind itself. The osteopathic profession is ready to make the investment.

PROPOSALS

A. It is proposed, therefore, that the osteopathic profession take under early and serious consideration the establishment and implementation of an osteopathic research program similar in nature and scope to that described previously and embodying three cardinal organizational features:

1. Maximum utilization and expansion of existing and potential research resources in the colleges and other osteopathic institutions.
2. A centralized Osteopathic Research Institute.
3. Centrally planned stimulation and coordination of research throughout the profession.

B. It is proposed that concrete plans for such a program be drawn up in the near future, which shall comprise the basis of an extensive educational campaign among the profession and laity.

C. It is proposed that a system of postgraduate fellowships be established whereby selected D.O.'s may acquire specialized training for research and for teaching in the osteopathic colleges. It is recommended that the stipends be relatively generous, and that the Fellows be encouraged to study and work at the institutions providing the best training in their specialties, and for as long as is required. As many of these Fellows as possible shall upon completion of their studies, be appointed to the faculties of our osteopathic colleges to teach, conduct research, and to train other osteopathic research workers.

D. It is proposed that the leadership of the American Osteopathic Association take under consideration sources of funds and means for the establishment of a substantial research budget adequate to the program outlined, and in which provision for regular increases is made.

Such a program represents an historic opportunity for the profession, but at the same time it will represent a great and continuing responsibility. An adequate research program, such as that suggested, requires far more than the creation of the machinery and the instrumentalities. It requires more than financial support. In all respects the success of the program, the productivity of the machinery, will be in proportion to the power and the sustenance provided by the profession. These are measured in terms of moral and intellectual support and cooperation as well as in economic sacrifice.

It has to be recognized that the osteopathic colleges must form the very foundation for such a program—a foundation which yields sustaining nourishment and inspiration to the osteopathic research program. Of all the resources involved in and required for research none is more precious and more urgently needed than research personnel. Our wealth in that resource will be in proportion to the quality and scope of our educational program. Our faculties must consist of the best osteopathic physicians, the best specialists and the best scientists. They must be given the wherewithal to do their best work. Only in this way can the colleges themselves become research centers; only in this way can they produce critical and scientifically minded physicians who will be on the constant look-out for technical advances to be incorporated in their practice; only in this way can they produce the steady stream of osteopathic research workers who can provide those advances for the profession. At the present stage of osteopathic development, the colleges are becoming more and more the determiners of the rate of progress —and of the future of osteopathy.

The success of the program will require new habits of thought from the entire profession. Success of a scientific program requires a scientific atmosphere. Research cannot flourish if the profession upon which it depends for sustenance and inspiration is slow or reluctant to cast aside cherished, but disproved, notions for new and substantiated concepts and for superior methods which emerge from the research program.

New habits of objectivity will need to be acquired. Dogmatism will have to be replaced by fact; fervor and wishful thinking by science and logic. It will not be possible to make statements and claims or give explanations unsupported by evidence, regardless of how reasonable they may appear. Editorial staffs of osteopathic journals must establish rigorous standards; contributors of clinical and other articles should be required to substantiate all statements and conclusions; it will be necessary to quote data rather than opinions. Such new standards, therefore, will require in turn that osteopathic physicians, especially those who teach and write, shall familiarize themselves with the current scientific and clinical literature in their respective fields.

This is doubtless a very big order. Its fulfillment will require the same vision, the same disdain for orthodoxy, the same courage, energy and devotion to principle that made possible the birth, survival and maturation of osteopathy in the face of scorn, skepticism and organized opposition. Today the choice is between senescence and renascence.

Kirksville College of Osteopathy and Surgery

THE LAW OF AGENCY IN THE PRACTICE OF PHYSICAL MEDICINE

The law of agency affects the physician in a peculiarly forceful way whenever he prescribes the use of physical agents for therapeutic purposes . . . Supervision of the acts of the individual to whom the physician has delegated power is implied in the law of agency, and the physician is held liable for the acts of his agent.

In most states, physical therapists do not have a recognized legal status. Thus, only a licensed physician can delegate to them the right to administer physical agents for the alleviation of human suffering or the treatment of disease.

Although physical medicine proved itself to be a useful adjuvant form of therapy in the rehabilitation of those disabled in World Wars I and II, medical schools did little in the interim between these conflicts to put physical medicine on a sufficiently sound scientific basis to justify the inclusion of its systematic study in the training of all physicians.

Except for the orthopedist, few physicians follow the patient to the physical therapy department. This, and the long tolerated discrepancy in educational opportunity on the medical and technical level, have made it difficult to establish the kind of relationship between the physical therapist and the referring physician imperative for the development of physical medicine's maximal therapeutic potentialities.—F. A. Hellebrandt, *Journal of the Association of American Medical Colleges*, November, 1947.

Department of Public Relations

CHESTER D. SWOPE, D.O.
Chairman
Washington, D. C.

D.O.'S ELIGIBLE FOR MEDICAL APPOINTMENTS IN U. S. PUBLIC HEALTH SERVICE

Public Law 425 (S. 1454), approved by President Truman on February 28, 1948, amends the Public Health Service Act in regard to matters of personnel and administration, and includes the following provision:

"Graduates of colleges of osteopathy whose graduates are eligible for licensure to practice medicine or osteopathy in a majority of the States of the United States, or approved by a body or bodies acceptable to the Administrator, shall be eligible, subject to the other provisions of this act, for appointment as commissioned medical officers in the Public Health Service."

First appearing as an amendment to H.R. 3924, the provision was made a part of S. 1454, the companion bill in the Senate, and enacted into law.

The following testimony in support of appointment of osteopathic graduates as medical officers in the Public Health Service is excerpted from the Hearings on H.R. 3924 held by the Committee on Interstate and Foreign Commerce of the House of Representatives, July 3, 1947:

STATEMENT OF HON. WAT ARNOLD, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MISSOURI

Mr. ARNOLD. I have a statement, Mr. Chairman.

I hope this committee will write an appropriate provision into this bill, H. R. 3924, to make it clear that doctors trained in osteopathic schools and hospitals are qualified under the law to serve as medical officers in the United States Public Health Service.

The first school of osteopathy was established more than fifty years ago at Kirksville, Mo., in the congressional district I have the honor to represent. That institution is known as the Kirksville College of Osteopathy and Surgery. It is one of the most respected institutions in the United States. Its student body come from all over the country. I venture to say that its alumni are practicing in each of the 48 States, and some foreign countries.

The college hospital was designated by the Federal Government as a penicillin depot and a streptomycin depot during the war. The college and hospital are recognized for and are training veterans. They are recognized for training doctors to work for the Veterans' Administration. I see no reason why they should not be recognized for training doctors to work for the Public Health Service. The county health officer for my county is an osteopathic physician.

The United States Public Health Service, itself created by Congress, now says that it cannot get enough doctors to carry out the duties Congress has assigned to it. The Public Health Service has asked Congress to provide additional ways and means. Yet they continue to turn down applications from qualified doctors trained in osteopathic colleges and hospitals. I understand the Public Health Service has suggested raises in pay for doctors as a partial solution. Congress should leave nothing undone which could be helpful in obtaining the necessary doctors. At the same time, the Public Health Service ought to avail itself of every qualified source of supply.

A declaration by Congress that osteopathic graduates shall be eligible to qualify as medical officers in the Service will certainly evidence the intention that the Public Health Service shall explore and avail itself of the qualified and available manpower resources of the osteopathic school of medicine. I hope such a declaration can be made a part of this bill.

Mr. DOLLIVER. The next witness is Mr. Lawrence L. Gourley, legal counsel, American Osteopathic Association, Washington, D. C.

Mr. Gourley, we will be glad to hear from you.

STATEMENT OF LAWRENCE L. GOURLEY, LEGAL COUNSEL, AMERICAN OSTEOPATHIC ASSOCIATION, WASHINGTON, D. C.

Mr. GOURLEY. We appreciate this opportunity of making a statement before this committee.

I am legal counsel for the department of public relations of the American Osteopathic Association, and appear here at the instance of the chairman of that department, Dr. Chester D. Swope.

This bill, H. R. 3924, amends the Public Health Service Act in a number of particulars in matters of personnel and administration. . . . There is at present, but not for long, a provision in the Public Health Service Act which expressly makes osteopathic graduates eligible for appointment as Reserve officers in the Service.* That provision, section 709 of the act of July 1, 1944, as renumbered by the act of August 13, 1946, reads as follows:

"For the duration of the present war and for six months thereafter graduates of reputable colleges of osteopathy shall be eligible for appointment as Reserve officers in the Service."

*Repealed by law terminating certain emergency and war powers (Public Law 239, approved July 25, 1947).

That provision making osteopathic graduates eligible for Reserve appointments was first a part of section 4 of the Public Health Service Act of 1943, Public Law 184, 78th Congress. When the Public Health Service laws were consolidated and revised as the Public Health Service Act, Public Law 410, 78th Congress, that provision was incorporated under temporary provisions as section 609, and the section was renumbered to become section 709 by Public Law 725, 79th Congress.

When that temporary provision was before Congress in 1943 and 1944, the American Osteopathic Association appeared and offered supportive testimony before the House Committee on Interestate and Foreign Commerce and the Senate Committee on Education and Labor. All the testimony recorded in the hearings with respect to the provisions indicated that the eligibility was for appointments as medical officers. All our negotiations with the Public Health Service regarding implementing regulations between the approval of Public Law 184 on November 11, 1943, and the approval of Public Law 410 on July 1, 1944, was based on eligibility as medical officers. At no time was there any indication that the law meant otherwise. We certainly understood that it meant medical officers and we believe that Congress so intended but we were wrong; it meant sanitarians.

Osteopathic candidates made their applications for appointment as medical officers. They were denied appointment as medical officers and offered commissions as sanitarians. The candidates asked the American Osteopathic Association for advice. The candidates had been trained as physicians in osteopathic schools of medicine. The act of Congress respecting eligibility as Reserve officers had been construed as eligibility as sanitarians in the Reserve. The President had been authorized to declare the Public Health Service a military organization in time of war, which he later did. The association advised the candidates that this being a war measure, they should accept the commission as sanitarians for the emergency. Five osteopathic physicians were commissioned in the grade of sanitarian, and so served. The war emergency being over, they have now returned to civilian practice.

It now appears that there is dire need for medical officers in the Public Health Service. The Surgeon General has emphasized that need this afternoon. The Deputy Surgeon General of the Public Health Service, Dr. James A. Crabtree, so testified before the House Armed Services Committee on June 6, 1947. In the same hearing, Honorable Watson Miller, Federal Security Administrator, stated:

"The steadily increasing shortage of physicians in the Public Health Service is a matter of great concern to me."

Evidence submitted at that time showed that the Public Health Service operates 27 hospitals; that it operates hospitals and medical installations at all Federal prisons; that it provides medical and hospital care for the Coast Guard and for the merchant marine; and that it provides medical and hospital care for beneficiaries of the Federal Employees' Compensation Act. That is only a part of the functions of the Public Health Service in which the professional services of physicians are employed.

In view of the fact that education and training in institutions of the osteopathic school of medicine closely parallel that afforded in institutions of the allopathic and homeopathic schools of medicine, and the further fact that in a number of States osteopathic candidates and medical candidates take the same State board examinations and receive the same or equivalent license to practice, surely the skills of osteopathic graduates can and ought to be utilized as medical officers, thereby contributing to the relief of the dire shortage of medical officers in the service.

It may be contended that there is nothing in the Public Health Service Act which prevents the President from appointing osteopathic graduates as medical officers in the service. That is true, but neither is there anything in the act which expressly indicates osteopathic eligibility.

We contend that such an expression of intent is necessary, as proposed in our amendment.

In 1930, Congress passed a law with respect to Public Health Service regulations stating:

"No regulation relating to qualifications for appointment of medical officers or employees shall give preference to any school of medicine." That provision is now incorporated as section 215 (c) of the Public Health Service Act.

Gould's Medical Dictionary defines osteopathy as—

"A school of medicine based upon the theory that the body is a vital organism whose structure and function are coordinate and that disease is perversion of either, while its therepeutics is largely manipulative restoration of these abnormalities."

Dr. Walter J. Greenleaf, specialist, Occupational Information and Guidance Service, U. S. Office of Education, in his guidance leaflet on osteopathy, states:

"Osteopathy is the school of medicine or the art and science of prevention, diagnosis, and treatment of diseases and injury which majors in manipulation and includes surgery and other branches (specialties) in the healing arts."

If permissible, I should like to include in the record, at this point, an excerpt from that leaflet descriptive of the preosteopathic college credits required and standard minimum curriculum of approved osteopathic colleges.

Mr. DOLLIVER. May I examine that; what you wish to insert?

Mr. GOURLEY. Yes, sir; beginning there and ending there.

Mr. DOLLIVER. Your request for the insertion will be granted at the point indicated.

Mr. GOURLEY. Thank you.

(Excerpt from the leaflet included those sections dealing with "Preosteopathic College Credits Required" and "Standard Minimum Curriculum of Approved Osteopathic Colleges.")

The Public Health Service regulations do not literally give preference to any school of medicine. I have here an announcement of the Public Health Service under date of January 17, 1947, of a competitive examination for appointment of medical officers in the Regular Corps which states in part as follows:

"Applicants must be at least 21 years old, citizens of the United States and graduates of recognized medical schools."

There is nothing in that announcement which indicates that osteopathic candidates may not apply; nor is there anything to indicate that they may apply. In any event, when they do apply, their applications are rejected on the ground that there is no place for them in the Service.

Anything less than express provision by Congress of osteopathic eligibility as medical officers, has proved to be of no avail.

On the contrary, express provision by Congress has proven effective. Witness the appointments made under the temporary provision which the Public Health Service construed as eligibility for sanitarian appointments.

Another example of the effectiveness of congressional provision of eligibility is provided by the May 31, 1938, amendment to the U. S. Employees' Compensation Act (U. S. C., 1940 edition, title 5, sec. 790), whereby Congress specifically defines the term "physician" and the term "medical, surgical, and hospital services and supplies," to include services by osteopathic physicians and hospitals. The U. S. Employees' Compensation Commission contended at the time that it had authority to furnish the services of osteopathic physicians and hospitals for the care of Federal civil employees who become ill or injured due to their employment. It just would not see fit to exercise the authority. When Congress specifically passed the amendment giving express authority in 1938, the Commission promptly exercised that authority and continues to do so.

An example of executive exercise of express authority granted to appoint osteopathic physicians as medical officers is furnished by section 5 of the act of January 3, 1946, establishing a Department of Medicine and Surgery in the Veterans' Administration. The Administrator of Veterans' Affairs contended at the time that he had the authority. He just was not exercising it. Section 5 of the act (Public Law 293, 79th Congress) reads in part as follows:

"SEC. 5. Any person to be eligible for appointment in the Department of Medicine and Surgery must—

"(a) Be a citizen of the United States.

"(b) In the Medical Service—

hold the degree of doctor of medicine or of doctor of osteopathy from a college or university approved by the Administrator, have completed an internship satisfactory to the Administrator, and be licensed to practice medicine, surgery, or osteopathy in one of the States or Territories of the United States or in the District of Columbia."

As a result of that express authority granted by Congress, the Administrator of Veterans' Affairs has made and is making appointments of osteopathic physicians in the Department of Medicine and Surgery of the Veterans' Administration.

By provisions of Public Law 604, 79th Congress, approved August 2, 1946, Congress expressly declared osteopathic graduates eligible for appointment as commissioned medical officers in the Navy as follows:

"SEC. 41. The President, in his discretion, is authorized to appoint, by and with the advice and consent of the Senate, graduates of reputable schools of osteopathy as commissioned medical officers in the Navy, in such numbers as the President should determine to be necessary to meet the needs of the naval service for officers trained and qualified in osteopathy."

The Navy contended at the time that it had the authority. It just was not exercising it. Nevertheless, Congress proceeded to grant express authority; the President has not yet designated the number of osteopathic graduates to be appointed.

From the foregoing, it is apparent that in the absence of express declaration by Congress of osteopathic eligibility as medical officers, no appointments are made, whereas the contrary has been true when Congress has made express provision of osteopathic eligibility.

There are some 11,000 legally licensed osteopathic physicians or surgeons and in excess of 300 osteopathic hospitals in the United States. An annual average of 400 graduate in normal years from the six recognized schools of osteopathy and surgery, each graduate having had a minimum of two years, many have had four years, training in an accredited liberal arts college prior to admission to the four-year course in an osteopathic college. Fifty-eight intern-training hospitals are approved after annual inspection by the American Osteopathic Association.

Physicians trained in osteopathic institutions are legally licensed and practicing in all of the States. They take their places as general practitioners; specialists; as members of State boards of health; as county, city, and town health officers; and as industrial plant physicians and school physicians.

They should be permitted to qualify and take their places in the Public Health Service, in unmistakable language as medical officers as provided in the proposed amendment.

Mr. DOLLIVER. Thank you, Mr. Gourley.

Any questions, Mr. Priest?

Mr. PRIEST. No, Mr. Chairman. I believe the statement is fully clear.

Mr. GOURLEY. Thank you very much for your attention.

INTERDEPARTMENTAL COMMITTEE ON RESEARCH AND DEVELOPMENT

On February 4, 1948, the President appointed Dr. Alexander Wetmore, Secretary of the Smithsonian Institution, as Chairman of the Interdepartmental Committee on Research and Development which was established by Executive Order, December 24, 1947. He also appointed Dr. Thomas B. Nolan, Assistant Director of the Geological Survey of the Interior Department, as Vice-Chairman.

He announced as other members of the Committee: Dr. James B. Fisk, Director, Division of Research, Atomic Energy Commission; Dr. E. U. Condon, Director, National Bureau of Standards, Department of Commerce; Miss Mary E. Switzer, Assistant to the Administrator, Federal Security Agency; Dr. Hugh L. Dryden, Director of Aeronautical Research, National Advisory Committee for Aeronautics; Dr. W. V. Lambert, Research Administrator, Department of Agriculture; Dr. J. E. Graf, Assistant Secretary, Smithsonian Institution, Deputy for Chairman Wetmore; Dr. E. H. Cushing, Assistant Medical Director for Research and Education, Veterans Administration; Major General Henry S. Aurand, Director of Service, Supply and Procurement of General Staff, Department of the Army; Major General A. C. McAuliffe, Deputy Director for Research and Development, Department of the Army, Deputy for General Aurand; Major General L. C. Craigie, Director of Research and Development, Department of the Air Force; Dr. Lawrence R. Hafstad, Executive Secretary of the Research and Development Board, National Military Establishment; Rear Admiral P. F. Lee, Chief of Naval Research, Department of the Navy.

In announcing the Committee, the President said the need for it was emphasized in the recent reports made to him by the Chairman of the Scientific Research Board. These reports clearly indicated that there was no central group equipped to advise on the relationships among the numerous and complex Federal scientific activities or to take leadership in the solution of administrative problems common to different agencies.

"The relationship of the Federal research program to our National welfare and the money spent annually for research by the Government make the establishment of this Committee a matter of National importance," the President said.

"The Committee will recommend to the President, and to the heads of the Federal agencies concerned, steps to make research and development programs most effective in the promotion of the national welfare. Among the specific assignments of the Committee will be a study of changes in the administrative policies and procedures to increase the efficiency of the Federal research and development programs.

"The Committee has also been asked to report upon current policies and administrative practices relating to Federal support for research such as grants and contracts for basic research.

"In carrying on its functions, the Committee has been asked to obtain the advice of persons outside the Federal Government and to propose means by which information relating to the status and results of scientific research undertaken by the Federal agencies can be most effectively disseminated."

NATIONAL HEALTH ASSEMBLY

Oscar R. Ewing, Federal Security Administrator, announced the formation of a National Health Assembly, to be held in Washington, May 1-4. The Assembly is being set up as a result of the message of President Truman to Mr. Ewing on January 30 in which Mr. Ewing was requested to develop feasible national health goals for the next 10 years.

Twenty-four national leaders in various fields have been invited by Mr. Ewing to serve on the executive committee of the Assembly, which will consist of representatives of public and private organizations and agencies in the country concerned with various phases of the Nation's health. Preliminary estimates are that 700-800 people will attend the Assembly sessions.

Most of the activity of the Assembly, Mr. Ewing said, will be in the form of panel discussions, each panel to explore fully a specific phase of the health problem. The number and membership of the panels will be announced shortly.

In announcing the Assembly, Mr. Ewing made the following statement:

I consider the request of the President one of the most important assignments ever given in peace time to a Federal

agency, and the projected National Health Assembly can be of tremendous value in helping the Federal Security Agency in carrying it out.

Meeting together, spokesmen for the medical and health professions, for our great national voluntary health organizations, and for the citizens generally will have an opportunity to examine every facet of the problem.

I hope that, in the real sense of the words, this Assembly will spring from, and its results go back to the "grass roots" of the country.

In the final analysis, health is the people's job. We can have national interest and action only to the extent that we have community interest and action. So the job, as I see it, is this:

To see what we have—to know accurately the health facilities and personnel of the Nation and each community

To determine what we need; the difference between the two will show us our health deficits

To devise feasible methods of meeting these deficits.

No one of us has the whole answer. But teamwork is in the American tradition and in the spirit of our present endeavor. Many groups and many individuals must pool their experience, their technical knowledge, and their collective wisdom.

One important thing that we hope will come out of the Assembly is a clearer picture of just how much agreement there is in certain supposedly controversial health fields. I have an idea we are going to find that these areas of agreement are larger than many people think. Once we have that established, we can find out how far we can all go forward on a nation-wide front. To the extent that the Assembly achieves this, it will produce a solid foundation for the ten-year program which the President has asked the Federal Security Administrator to draw up.

In addition, what comes out of the Assembly should have immediate benefits:

1. A guide to community action for local health improvements;

2. A detailed, practical pattern of cooperation among all organizations operating in the health field—public and private; national, state, and local; and

3. A more detailed and specific knowledge of our present health picture and of the job that has to be done to improve it.

EXECUTIVE COMMITTEE MEMBERS AS OF FEBRUARY 13

Mr. Barry Bingham, Editor and President, Louisville Courier-Journal.
Mrs. J. L. Blair Buck, President, General Federation of Women's Clubs
Mr. Earl Bunting, President, National Association of Manufacturers
Miss Elisabeth Christman, Secretary-Treasurer, National Women's Trade Union League
Dr. Louis I. Dublin, Second Vice-President and Statistician, Metropolitan Life Insurance Co.
Judge Jerome N. Frank, U. S. Circuit Court of Appeals
Mr. Albert S. Goss, President, National Grange
Mr. William Green, President, American Federation of Labor
The Most Rev. Francis J. Haas, Bishop of Grand Rapids, Grand Rapids, Mich.
Miss Frieda Hennock, New York City
Mrs. L. W. Hughes, President, National Congress of Parents and Teachers
Mr. Eric Johnston, President, Motion Picture Producers & Distributors of America
Mr. Allan Kline, President, American Farm Bureau Federation
Mrs. Mary Lasker, New York City
Mrs. David Levy, New York City
Dr. George F. Lull, Secretary and General Manager, American Medical Association
Mrs. Eugene Meyer, Washington, D. C.
Mr. Philip Murray, President, Congress of Industrial Organizations
Mrs. Anna M. Rosenberg, New York City
Mr. Earl O. Shreve, President, U. S. Chamber of Commerce
Dr. Frank Stanton, President, Columbia Broadcasting System, Inc.
Mr. M. W. Thatcher, President, National Federation of Grain Cooperatives
Mr. Walter White, Secretary, National Association for the Advancement of Colored People
Dr. Abel Wolman, Consulting Engineer, Johns Hopkins University

TEXT OF PRESIDENT TRUMAN'S LETTER

The President on January 30 addressed the following letter to the Honorable Oscar R. Ewing, Administrator of the Federal Security Agency:

"Dear Mr. Administrator:

"The health of our people is of such importance to our national welfare and security that I wish to make certain that we are taking all possible steps to contribute to its improvement. I have, as you know, repeatedly requested the Congress to enact legislation designed to expand basic health services and to bring them within the reach of all the people. While such legislation is of primary importance, its enactment alone will not assure that we shall reach the highest possible levels of health. The attainment of such a goal requires the cooperation of State and local governments, voluntary organizations, the medical and health professions, as well as all of our citizens working together.

"Our people want good health and are willing to work to achieve it. Notable progress has already been made. But I am convinced that we have scarcely scratched the surface and that, as a Nation, we can make rapid progress in the immediate future.

"I should like to ask you, therefore, to undertake a comprehensive study for the possibilities for raising health levels and to report to me, at your early convenience, upon feasible goals which might be realized by the American people in the next decade. I should appreciate further any suggestions you may wish to make concerning the most practicable methods of achieving such goals. In preparing this report, you will undoubtedly wish to confer with interested persons both in and out of the Government.

"Very sincerely yours,
(Signed) HARRY S. TRUMAN."

DR. LEONARD A. SCHEELE TO SUCCEED DR. THOMAS PARRAN AS SURGEON GENERAL, U. S. PUBLIC HEALTH SERVICE

On April 6, 1948, Dr. Leonard A. Scheele will succeed Dr. Thomas Parran as Surgeon General of the Public Health Service. Dr. Scheele was born in Fort Wayne, Ind., July 25, 1907. He received his A.B. degree from the University of Michigan in 1931; his B.S. in 1933 and his M.D. in 1934, both from Wayne University, Detroit.

He was commissioned in the U. S. Public Health Service in 1934. His first assignment was as Assistant Quarantine Officer at the Port of San Francisco. He was transferred to the same position in the Port of Honolulu during 1935-1936, then was made Health Officer of Queen Anne's County, Maryland, in 1936-1937.

From 1937 to 1939 he was a Special Fellow at Memorial Hospital, New York City, New York.

He was Officer in Charge of the National Cancer Control Program of the National Cancer Institute from 1939 to 1942. In this capacity he was concerned with studies in epidemiology of cancer, in end-results of cancer treatment and liaison with the States and various medical organizations on cancer control. He held the position of Chief, Field Casualty Section, Medical Division, U. S. Office of Civilian Defense in 1942 and 1943.

From 1943 to 1945 he was assigned to the Army in a variety of major assignments in war areas. He served in Military Government and Allied Commission medical operations in Sicily, Italy, and later was in charge of the Preventive Medicine Section of the G-5 Division of Supreme Headquarters of the Allied Expeditionary Force in Northwest Europe. Later he was medical representative of the Medical Section of the Allied Control Council in initial operations of that group in Berlin after the surrender of Germany.

Military decorations he received include the American Typhus Medal for his work in the control of that disease in

Northwest Europe during 1944-45; the Legion for Merit for outstanding work in controlling communicable diseases in the European Theater of Operations; the Order of Public Health, from France, and several other foreign decorations.

During 1946-1947, Dr. Scheele was Assistant Chief of the National Cancer Institute of the Public Health Service's National Institute of Health. In July 1947 he became Assistant Surgeon General of the Service and Director of the Cancer Institute.

MORE DOCTORS NEEDED

The following significant statement is excerpted from the address of Federal Security Administrator, Oscar R. Ewing, delivered before the National Health Council, February 17, 1948:

New schools have been authorized in many states—in Washington, Missouri, North Carolina, and California, for example. In several others, there is active planning for new medical education facilities. And I hope that in my own great State of New York we will soon open some publicly supported medical schools.

Expanding existing schools is of vital importance. If they had the money, many of them would increase their facilities and add to their teaching staffs. Medical education is expensive, and the deficit between actual cost and tuition fees makes it imperative for the schools to find a stable basis of financing their work.

I am convinced Federal aid to medical schools and to medical students is essential if we are to have the doctors necessary for the health and well-being of our people. You know, of course, that the State and Territorial Health Officers, at their Annual Meeting in December, recommended a program of Federal aid to medical schools and a system of medical scholarships.

We have discussed with leaders in medical education various legislative proposals looking toward Federal assistance to medical education.

The present state of my thinking on what the Federal legislators should provide runs about like this: To begin with, I believe the law should set forth specific purposes so that its objectives may be clear guides to all. This should include;

First, a Congressional finding that we suffer from a shortage of doctors, dentists, nurses, and other health personnel essential to maintaining the Nation's health, and that this shortage is aggravated by the inability of many qualified individuals, particularly members of minority groups, to obtain professional training.

Second, a declaration of national policy to increase the number of doctors, dentists, nurses, and others to serve the American people, and to take such steps and use such Federal resources as are necessary to overcome shortages in these fields. I believe the only justification for a program of special aid for medical schools at this time is assurance that it will help to meet the serious doctor-deficiency facing our Nation.

Third, a clear-cut and unambiguous declaration that opportunities made available under the bill be open for all qualified individuals, without discrimination because of race, creed, color, or national origin.

How do we propose to accomplish these aims? By three types of programs: (1) grants to medical schools for operating expenses; (2) grants to medical schools for construction of new buildings and additions to existing buildings; and (3) a scholarship program to increase the number of persons training for medical, dental, nursing, and public health service to the Nation.

I should like to discuss each of these programs somewhat more fully:

First, Grants for Operating Expenses.—We contemplate a program of grants of approximately $50,000,000 annually to schools of medicine, dentistry, nursing, and public health. This is considerably less than the medical school deans say is necessary, but I believe it will be a good start. These grants would be available for hiring staff, operating facilities, and buying equipment.

As an example of how these funds might be distributed, the bill might assure each 4-year-old school of say a flat $100,000 each year. In addition, each school might receive a further amount based upon the number of students, thus creating an incentive for increased enrollments.

To be eligible for such grants, a school must give assurance—

That it is training the maximum number of students, of which its facilities and resources are capable, consistent with acceptable standards;

That it will not impose unreasonable restrictions on non-residents awarded scholarships under the program; and

That it admits students without discrimination on the basis of race, creed, color, or national origin—except that where segregation of Negroes is required by law, a showing must be made that comparable educational opportunities are provided for Negroes.

No grant would exceed 50 per cent of the cost of instruction in the school during the year.

Second, Grants for Construction of Medical Schools.—Since it has not been possible in advance to estimate the amounts of money that would be needed, the size of this part of the program might well be left, at this state, to annual determinations through appropriation requests.

Applications for the grants would have to give assurance identical to those I have already outlined, and grants would be made in the order of their effect in alleviating the shortage of medical and health personnel. These grants, too, would not exceed 50 per cent of the total cost.

Third, Scholarships.—I have in mind two types of scholarship—a State scholarship for doctors, nurses, dentists, and public health personnel who could practice anywhere they wanted; and a National medical scholarship for doctors who agree to serve for a time in special shortage areas.

The State scholarships would be made possible through grants to each of the States, for a total of 10 per cent of the doctors, dentists, nurses, and public health personnel enrolled in such professional schools. This would assure all parts of the country the opportunity for improving the health service available to their residents. No State should receive this grant unless scholarship selection is made without discrimination for reasons of race, creed, color, or national origin. The amount of a State scholarship, would include tuition, books and fees, but not room and board.

The National medical scholarships would not exceed 600 annually, and would be available to doctors who agree to serve for some period in Federal medical establishments—such as the Veterans Administration, the Public Health Service, the Army, and the Navy—or in State and local health agencies—as, for example, in doctor-shortage areas designated by State health authorities. Selections would be made by a top-flight Medical Scholarship Board composed of representatives of the medical and educational groups, and the public. These scholarships would cover tuition and would also include $90 a month for living expenses.

Needless to say, the bill should clearly provide that no Federal employee may exercise control over the professional standards, academic qualifications, curriculum, or administration of any medical school.

These are the lines on which we see such a program shaping up, according to our thinking and discussion so far. Of course, it is still in process of development. It needs the fullest possible consideration. It may not be an ideal program. But I am convinced that it would break a serious log-jam obstructing the medical care our people need. I bespeak your support for it, and I urge you to give it your earnest attention.

It is my sincere conviction that this national problem demands national action. But it is certainly not a job for the Federal Government alone. As I have indicated, the States have an important part to play. Mississippi, for example, has already taken significant steps to provide scholarships to worthy medical students who will practice in rural areas. The voluntary associations, too, have an essential role—exemplified by the generous contributions of your members to training in many fields of specialization. Such activities are indispensable; they must be continued and speeded up.

These are some of the challenges we must meet. Though I have tried to outline the direction of my own thinking, I feel that constructive, practical answers can be reached only by all of us, thinking and working together. We shall turn to you repeatedly for advice and counsel.

I cannot conclude this talk with any formal peroration. It is unfinished business—and it is your business and mine and that of every citizen. We need to work at it day in and day out. We need to meet frequently to iron out our difficulties and consolidate our gains. With that purpose, and in the spirit of public service which the National Health Council represents, I look forward to the conference in May.* I look forward beyond it to years of intensive, cooperative effort. And I look forward to progress that will fulfill the high promise of medical science for all Americans.

QUALIFICATIONS FOR VETERANS ENTERING MEDICAL SCHOOLS

Veterans, about to enter medical school under the G.I. Bill or Public Law 16, stand a better than average chance of completing their training successfully if they meet any, or preferably all, of the following qualifications:

1. Obtain grades of B plus or better in their premedical training
2. Make particularly high grades in the natural sciences
3. Enroll in medical schools in the same educational institution in which they completed their premedical work.

These conclusions, compiled by Veterans Administration from previously published studies, were distributed in a bulletin to VA vocational advisers and training officers. Purpose of the bulletin is to help VA officials advise ex-servicemen and women desiring to enter medical school under either law.

One study, quoted in the bulletin, disclosed that at Baylor University Medical School in Waco, Texas, 99 per cent of all failures during a 10-year period were those of students whose pre-medical grades averaged below B plus.

Another study, conducted between 1928 and 1938 at the University of Tennessee College of Medicine, revealed that average grades for medical students during the first three quarters of their professional training was about 6.11 percentage points below their premedical averages. Based on this study, it follows that a veteran with merely fair premedical grades would have but a slight chance of successfully completing medical school, the bulletin points out.

In predicting medical school success on the basis of grades received in natural science courses, VA emphasized that the quality of work in such courses, rather than the quantity of science courses studied, is the important factor. Many students who take every undergraduate science course available "develop a false sense of security by assuming that the pursuit of extensive work in the sciences necessarily places them in a better position to cope with medical school work," the VA study observed. "Actually, the number of credit hours in premedical science courses is unrelated to medical school performance."

In addition to grades received in science subjects, the studies proved that achievements in the social sciences could be utilized as fairly reliable indicators of probable success in medical school.

The research findings analyzed by VA disclosed that students who attend medical schools in the same educational institutions where they took their premedical training consistently make better grades than students who transfer from other schools. The percentage of failures of "native" students also was appreciably lower than for transfer students.

VA explained the consistently superior accomplishments of "native" students by the fact that medical schools, able to consult personally with premedical faculty members about the qualifications of applicants, are in a position to select those applicants most likely to succeed.

The VA bulletin cautioned that scholastic aptitude tests and the length of premedical training—when considered without relation to other factors—are unreliable in evaluating chances for success in medical school.

In one case, scholastic aptitude tests were administered to 1,000 prospective medical students. The tests correctly predicted successful completion of medical school only 53 per cent of the time. In fact, 5 per cent of the students whose classroom averages were among the highest made poor showings in their aptitude tests. The tests are of greatest value when utilized as supplements to other sources of information about a medical school applicant, such as his premedical collegiate record, achievements in science courses, and interests.

Although each year an increasing number of medical schools limit admittance only to students with bachelors' degrees, research studies have indicated that the length of premedical training has little bearing upon their future accomplishments in the study of medicine.

One study showed poorer medical school results from students with bachelors' degrees than for those with 3 to 4 years of premedical training who did not obtain degrees.

Another survey, conducted at the University of Buffalo, reported that the average 4-year grade of medical students with 2 years of premedical training was 82.8; for those with 3 years of premedical training, 81.9; and for those with 4 or more years of undergraduate work, 82.1. The VA study concludes that the quality, rather than the extent of college preparation, determines eventual performance in medical school.

The published studies, compiled by VA for its bulletin, have appeared in a number of professional journals, including the *Journal of the Association of American Medical Colleges*, and the University of Minnesota *Studies in Predicting Scholastic Achievement*.

*National Health Assembly, May 1-4, 1948.

G.I.'S RECEIVE INCREASED SUBSISTENCE ALLOWANCES

Only veterans in schools, colleges and universities pursuing full-time courses of education will be entitled to increased subsistence allowances under a law signed February 14, 1948, by President Truman, the Veterans Administration has announced.

Part-time students, on-the-job trainees and others will not be entitled to the increases, the VA ruling held. The bill, S. 1394, signed into law (Public Law 411), amends the Servicemen's Readjustment Act (G.I. Bill) and the Vocational Rehabilitation Act (Public Law 16) for the disabled.

The new payments will be at the monthly rate of $75 for a veteran without dependents, $105 for a veteran with one dependent, and $120 for a veteran with more than one dependent.

The higher rates are applicable to periods of training on and after April 1. However, since subsistence allowance checks are not due until the end of the month in which the veteran is in training, most of the eligible veteran-students will receive their first checks at the higher rates on or shortly after May 1.

Veterans taking any of the following types of training are not entitled to the increases, but will continue to receive subsistence payments at the old rates of $65 a month for those without dependents and $90 for those with dependents:

1. Part-time institutional training.
2. Institutional on-the-farm training.
3. Apprenticeship or other on-the-job training (for which veterans receive compensation for productive labor).
4. Combination or cooperative training (in which students attend school part time and are employed part time, usually in a related field).
5. Internship and residency training.
6. Graduate training under a fellowship requiring a reduced credit course-load because of services rendered under provisions of the fellowship.

Eligible veterans now in school, who are entitled to $75 or $105 under the new rates will not have to apply for the increased allowance. Existing applications will supply all the information needed to pay the new benefits. These veterans, therefore, need not write VA at the present time concerning their increases.

Veteran-trainees entitled to $120 because they have more than one dependent will be required to submit information about their additional dependents before payments at the new rate can be made.

In the case of dependent children, photostats or certified copies of their birth certificates will be necessary. In the case of dependent parents, evidence of actual dependency must be submitted.

If veterans now in training submit evidence of dependency prior to July 1, 1948, they will receive retroactive payments at the new rates back to April 1, 1948.

Book Notices

SIGNS AND SYMPTOMS. Edited by Cyril Mitchell MacBryde, A.B., M.D., F.A.C.P., Assistant Professor of Clinical Medicine, Washington University School of Medicine; Assistant Physician, Barnes Hospital, St. Louis, Mo. Cloth. Pp. 439, with illustrations. Price $12.00. J. B. Lippincott Company, 227 S. Sixth St., Philadelphia, 1947.

In this book, which is an approach to diagnosis, there is amassed the experience of several contributors, ably edited by Cyril MacBryde. The chief emphasis is placed on the patient's story and the correlating of relative items in the story that direct the thoughts to a promising line of investigation. It puts into an orderly form the unspoken and often automatic procedures that are followed in interviewing the patient. These authors have succeeded in bringing to the surface of consciousness highlights in history which in many instances have been relegated to the background. In other instances, pertinent details, either forgotten or unknown, have been included in the text.

This book is admirably arranged, opening with a chapter on the analysis and interpretation of symptoms and followed by a rather academic discussion of pain. It then devotes several chapters to the "site" of pain. The remainder of the book considers other aspects of disease of which the patient may complain, but which are at the same time objective, such as cyanosis, fever, edema, etc. Each subject is discussed as a clue to the clinical entity of which it is the most prominent feature and with a view of reaching a diagnosis. The nature, mechanism, and etiology of the symptom is extensively studied. Some of the less common symptoms, such as anhydrosis and hypothermia have been omitted, but in general the subject is well covered from the limited standpoint promised by the title. It will be found a useful addition to the library of any physician and a reference that will not go out of date but will have a lasting usefulness and be frequently consulted.

LEONARD V. STRONG, JR., D.O.

GROUP PSYCHOTHERAPY. By J. W. Klapman, M.D. Faculty, Northwestern University Medical School; Member, Board of Psychiatry and Neurology; Staff of the Institute for Juvenile Research. Cloth. Pp. 344, with illustrations. Price $4.50. Grune & Stratton, 381 Fourth Ave., New York City, 1946.

This is an unusual book. From its title one would not be greatly interested, but its content is truly fascinating. The principles enumerated apply as much to the individual therapeutic session as to the group.

The opening chapter deals with the historical development of the group psychotherapeutic movement. The second chapter complements the first by a consideration of the mental, moral, and cultural developmental pattern of human life. Chapter Three introduces Part Two of the work, and it takes up the dynamics of group therapy. This goes further and classifies psychotherapists in a graded scale between extreme analysts and extreme "repressive inspirational."

In Chapter Four the interrelation between group and individual psychotherapy is discussed and illustrated liberally with case references. The next chapter is a discussion of re-education. Chapter Six introduces Part Three, or Methods of Administration. The first considered is affective reeducation or psychodrama. The author quotes Moreno in this connection: "[He] conceives it to encompass all or most of the values of psychotherapy. It is, in his opinion, the psychiatric interview equivalent with the additional advantage that all the others, cast and audience, also participate. It is, too, a lecture on a carefully chosen topic; it is discussion, it includes catharsis, analysis of acted-out events, as the audience is allowed to discuss the dramatic action presented, and, lastly, it is re-education."

Puppetry is considered a variant of psychodrama. The next method is termed affective reeducation in the out-patient clinic. The author goes into considerable detail in describing methods used by various authors and their value in out-patient work. Then comes a consideration of group psychotherapy with "problem children" and their mothers. He quotes freely from the work of Slavson in this, while the work with the mothers is not greatly different from any other adult group.

Group psychotherapy in private psychiatric practice is considered of value regardless of the financial status of the case. The author states thus: "It is the contention here that many such quirks, emotional distortions, and various odds and ends of human behavior do not get themselves worked out properly in individual psychotherapy . . . but group therapy offers a much more hopeful prospect because for many individuals it may supply a deficiency not so well managed by the individual interview." He illustrates all his points by examples. The ideal class would consist of ten patients with two sessions a week, of an hour's duration. He advocates intensive therapy using the technics of Schilder and Wender.

The next chapter takes up affective re-education in the mental hospital. Here group work has its best setting. A sample outline of a course of lectures is given (twenty-four in the series). In addition, the case history method is discussed, as well as the best way of utilizing class discussion.

The next chapter, dealing with methods of affective re-education, lists first the qualifications of a therapist. The author cautions against intellectual rigidity that leads to a pedantry which, in the long run, proves inimical to success in psychotherapy. He then discusses transference, abreaction, catharsis, resistance, the selection of patients, assistants, records, class size, and frequency of session, as well as the grouping of patients. The final chapter deals with ancillaries to group therapy. These are hobbies, clubs, and publications.

For the doctor interested in psychotherapy, this book will provide interesting reading. The author obviously speaks with a voice of authority and experience. Much of the information included applies as much to the individual handling of patients as to group practice.

THOMAS J. MEYERS, M.A., D.O., F.A.C.N.

PRACTICAL CLINICAL PSYCHIATRY. By Edward A. Strecker, A.B., A.M., Sc.D., Litt.D., LL.D., M.D., Professor of Psychiatry, School of Medicine, University of Pennsylvania; Franklin G. Ebaugh, A.B., M.D., Professor of Psychiatry, University of Colorado, School of Medicine; Director, Colorado Psychopathic Hospital, and Jack R. Ewalt, M.D., Professor of Neuro-Psychiatry; Director, Galveston State Psychopathic Hospital, University of Texas Medical Branch. Ed. 6. Cloth. Pp. 476, with illustrations. Price $5.00. The Blakiston Company, 1012 Walnut St., Philadelphia, 1947.

This is the sixth edition of a very popular textbook of psychiatry. In this growing branch of medicine, tremendous strides have been made. The authors present the science as it is recognized today: "At the moment of conception, we represent a summary of the biologic history of mankind as represented by our particular set of ancestors. This heritage is a fact that cannot be altered in its fundamentals."

With this beginning there is a growth and development of a new being, which includes a consciousness "of self" which is an ever-changing, fleeting thing which Allport has likened to a "pencil point of light flickering our life experiences." This is part of the mind which observes and interprets. "We are prone to make interpretations which, after the few repetitions, we begin to regard as facts in their own right and from these draw still further wide-range conclusions. These conclusions we often attempt to defend, and in our search for adequate defense, make further interpretation of phenomena, and again regard the interpretation rather than the phenomenon itself as the fact."

The authors insist that "there can be no function without a structure behind it, and function is not inheritable." This extends to emotional experiences as well, which are undoubtedly "total organism reactions," but "laboratory data, as interpreted by various workers, may be summarized as showing that much of animal behavior is motivated by the wish to satisfy certain physiological needs of the body." It might be concluded that a given cross section of an individual's life is a composite, and an exact record of everything that has happened in the life of that person.

To understand the patient with psychiatric problems, his examination should show that the examiner: (1) Has a clear idea of what he needs to know, (2) has a sense of continuity and purpose in the examination, (3) approaches the patient with a real spirit of sympathetic understanding, (4) is willing to spend the time and energy necessary to establish rapport.

Following the examination, the patient is diagnosed—and then classified. There are three major classifications of psychoses: (1) Organic psychoses, (2) toxic psychoses, (3) psychogenic (functional) psychoses. Other classifications are given to illustrate how other authors handle this problem. In addition, the book includes the new classification of the Army Medical Department.

The clinical groups are handled in the order as given in the previous paragraph (epilepsy is included in the organic group), using Meyer's subdivisions of reaction types. In this subdivision, the manic-depressive syndromes and involutional melancholia are termed affective reaction types, and schizophrenia, schizophrenic reaction type. Paranoid syndromes are labeled paranoid reaction types and paranoia. This division in considering paranoid conditions is with emphasis upon the differences between paranoid and paranoia, the latter being an extremely rare condition.

The psychoneuroses are handled in fifty pages. The classification published in 1942 by the American Medical Association under the name of Standard Nomenclature of Disease and Operations is used, and illustrations of each category are given. Of treatment, they state, "There is little reason to doubt that the ultimate outcome of any particular case will vary considerably with the skill of the physician attempting to carry out the treatment . . . there are certain types of these cases in which the general practitioner, if sufficiently skilled in understanding and techniques, can carry on an adequate treatment program." Treatment is of two general categories, environmental manipulation and treatment of the individual. The goal of the latter should be to enable the patient to grow or develop sufficiently in his emotional intellectual stature to cope with ordinary environmental situations, and with occasional environmental stresses. "It would seem . . . that it is not the exact method of treatment that is so important as the skill of the therapist . . . and the ability he has to understand his patients . . ."

There is a chapter on children's problems contributed by Leo Kanner, which closes the book.

In the reviewer's opinion, this is the best text on psychiatry available today. It is not only brought to date, but the arrangement and handling of the subject material is done on the basis of clarity and eclecticism. It is true that the minor ambulant problems receive less consideration than they should, but ample bibliographies are included for those who would enquire further.

There are a surprisingly large number of typographical errors in the book, which, of course, do not detract from the subject matter.

SYNOPSIS OF NEUROPSYCHIATRY. By Lowell S. Selling, M.D., Ph.D., Dr. P.H., F.A.C.P., Director, Division of Mental Health, Florida Department of Health; Formerly, Attending Neuropsychiatrist, Deaconess Hospital; Associate Attending Neuropsychiatrist, Mt. Carmel Mercy Hospital, and Wayne County General Hospital; Director, Psychopathic Clinic, Recorder's Court, Detroit, Michigan; Assistant Professor of Criminology, Medical Jurisprudence and Social Hygiene, University of Illinois College of Medicine; Lecturer in Psychology, Wayne University; Visiting Professor of Psychology, Iowa State College. Ed. 2. Cloth. Pp. 561, with illustrations. Price $6.50. The C. V. Mosby Company, 3207 Washington Blvd., St. Louis, 1947.

This is the second edition of a rather popular work. It is an ambitious undertaking, for any attempt to "synopsize" neuropsychiatry today exposes itself to scathing scrutiny. However, the author has succeeded in collecting a great mass of detail and in arranging it in a readily accessible form.

The first section of 320 pages is devoted to neurology. It follows the usual sequence, beginning with studies of the basic nervous structure and the peripheral nerves and proceeding with those of the cord, the brain stem, the cranial nerves, the cerebellum, cerebrum, meninges, autonomic nerves, aphasias, convulsive states and muscle syndromes. This is very well done, and, for the student, should be of inestimable value.

The second section of 210 pages covers psychiatry. The first chapter is an attempt to epitomize the principles and theory of psychiatry. The next ten chapters are concerned with descriptive data pertaining to psychiatric entities. There are chapters on psychosomatic medicine, malingering, childhood behavior disorder, and psychopathic personalities.

The reviewer commends the book as a synopsis, which will serve for ready reference by the specialist, as a review for the student, and as a source of information for the general practitioner.

THOMAS J. MEYERS, M.A., D.O., F.A.C.N.

PROFESSIONAL ADJUSTMENTS IN NURSING. By Eugenia Kennedy Spalding, R.N., M.A. Professor of Nursing Education, Indiana University, Bloomington, Indiana; Formerly Associate Professor, School of Nursing Education, The Catholic University of America, Washington, D. C.; Associate Director, Division of Nurse Education, U. S. Public Health Service, Washington, D. C. Edition 3, revised and reset. Cloth. Pp. 509, with illustrations. Price $3.50. J. B. Lippincott Company, 227 S. Sixth St., Philadelphia, February, 1946.

The third edition of this book has been thoroughly revised in view of the social, political, economic, and nursing developments during the war and the postwar period.

This book is written for the graduate or senior student nurse and does not attempt to solve the problems of the profession but is a guide to understanding the issues creating the problems.

Four unit parts, an introduction and an appendix comprise the book. The introduction seeks to acquaint the nurse with the many sources of information available to her and how to use, collect, evaluate, and organize the material she obtains. Unit I is entitled "The Social, Economic, and Professional Outlook of the Graduate Nurse." Unit II takes up the various fields of work open to nurses, how the nurse may choose her field, and how she may be successful in it. The various professional organizations and activities are discussed in Unit III, and Unit IV contains miscellaneous subjects, including legal relationships, responsibilities and problems, economic security, professional relationships, and personal growth. A form for minutes and sample forms for budgets are given in the Appendix.

Each of the units is divided into sections at the end of which are a list of problems and a bibliography and suggestions for additional reading.

Since the author is eminent in the field of nursing education, she has a complete realization of professional problems and this text is an excellent guide to arming the nurse for a professional life.

ELEANOR BARTHA, R.N.

GRADUATE COURSES OFFERED

Des Moines Still College of Osteopathy and Surgery.—Cranial Osteopathy, basic course, April 5 to 17; advanced course (for physicians who have had the basic course) April 26 to May 8. Enrollment is limited. Tuition fee is $200 for 2 full weeks of lectures and technic. Address inquiries to John B. Shumaker, Ph.D., Dean, Des Moines Still College of Osteopathy and Surgery, 720-722 Sixth Ave., Des Moines 9, Iowa.

C. Paul Snyder, D.O., F.O.C.O.—Nineteenth Intensive Course in Otorhinolaryngology beginning July 26 for 75 hours. Address Dr. Snyder, 1721 Walnut St., Philadelphia.